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Vol. XXXIV, No. 5

SEPTEMBER, 1957

THE INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)

*A Bi-Monthly Record of
Veterinary Science*



(ESTD. 1924)

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Vol. XXXIV

September, 1957

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[THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION]

PUBLISHED ON ALTERNATE MONTHS

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

★

EDITOR

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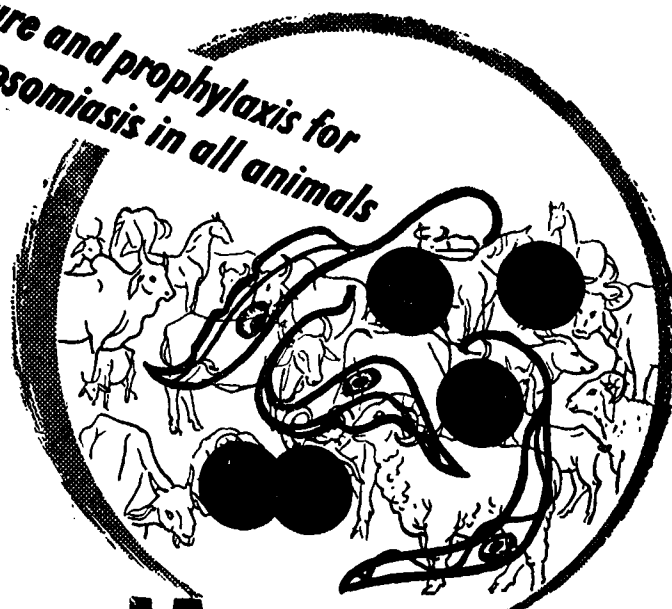
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Editorial

BOMBAY DECIDES

We are happy to announce that the present Government of Bombay have finally decided to transfer the Animal Husbandry work in that State from the Agricultural Department to the Veterinary Department. It is a momentous decision which will be welcomed with a sigh of relief by the entire profession in India and by all those who have bestowed some thought over it and have the best interests of the country at heart. We have said it before and we repeat it again, that no foreign pattern of education, organisation or administration will ever suit us. Every country has to evolve its own pattern to suit its economic and cultural standards. It is on this basic principle that we have been insisting upon the livestock work being concentrated in the hands of a single Department best suited for the purpose. Judged from all standards, the Veterinary Department has proved its natural aptitude for this work in almost all the States wherever it has been called upon to shoulder this responsibility. It was perhaps more in the nature of administrative convenience that the Government had asked the Agricultural Department to look after this work, at a time when the Veterinary Department had not fully developed. But Veterinary Science has been forging ahead with remarkable speed in recent years in this country and may be considered to have attained its maturity. What now remains is only developmental work in all its branches of Science and there can be no fixed target in that direction and so the work goes on. Having thus attained its 'majority' it is but natural that the Veterinary Profession should have been a little too

anxious to walk into its own estate. It is thankful to the ancient profession of Agriculture for looking after the estate so long and it only hopes that both the professions, like the two bullocks under one yoke, will pull together and try to bear the great burden of the rural economy of this land.

And now, no words are too great to express our gratitude to the present Government of Bombay. It was hurting the entire profession in India to note that such a major or shall we say, senior State like Bombay, after giving the lead in several matters to the rest of India, should have lagged behind all these years in such a vital matter of national importance. Indecision was the main feature of successive Governments and it was left to the present Cabinet of expanded Bombay to put an end to this indecision.

A post-war writer once said:—"Indecision is fatal. I would rather make a wrong decision, many of them, than build up a habit of indecision. I have known men who built successful careers in spite of wrong decisions, but never one who built a career on indecisions. If you are wallowing in indecision you certainly cannot act and action is the basis of success".

We tender our thanks on behalf of the entire profession in India, to the Government of Bombay. We are always at their service to render any possible help within our own sphere of work to advance the cause of Animal Husbandry, which they seem to have so much at heart.

We thank the Bombay Veterinary Medical Association and many other individual members, who have been working hard for years on end now, to bring about this reformation. Well done, Colleagues, serve more and deserve more, is our advice to you!

Like the fly on the wheel which imagines that it rotates the wheel, we may be pardoned if we suffer from a similar delusion and think that we have also contributed our own humble share in this magnificent affair. All is well that ends well.

EDUCATIONAL STANDARDS

Myself when young did eagerly frequent
 Doctor and Saint, and heard great Argument
 About it and about: but evermore
 Came out by the same Door as in I went

— Omar Khayyam.

Often we hear of the lowering of standards in educational institutions. With deep anguish, men talk of the general deterioration that has overtaken our educational system. As if to bear witness to this sad state of affairs, the Public Services Commission oblige us periodically with 'howlers' given expression to by the candidates they interview from time to time. But who is to blame? That is the most difficult question to answer with regard to this matter. Some shrug their shoulders and exclaim helplessly 'The time is out of joint'. A few others put the blame on the teachers and the taught. There are others who do not spare the parents and the politicians. All the above persons combine and blame in turn the present system of education that has become a sporting field to the academicians. They have not as yet started to blame the wind and the weather! We hear arguments and arguments and we are in no way wiser.

The evil seems to be spreading out its tentacles into the field of professional education also. Let us confine ourselves to our own profession. People often talk glibly that there is no need for such a high standard of education in our country as has been so assiduously built up by our pioneers in the field. There should be a sincere effort at clear-thinking in a matter of such vital importance. What is the purpose of education? Is professional education to be cribbed and cabined and kept only at the utilitarian plane to meet the bare needs of an undeveloped society of the present day or is it to advance into higher scientific planes and benefit the country and the humanity at large? The commercial aspect will only pull it down to the level of the market-place. It can at best be a secondary or incidental object. There are higher and nobler objects to pursue and achieve by a learned profession. Professional education is not merely putting old knowledge into new minds—that will only make the society

and the profession static—but it should be so comprehensive and broad-based as to stimulate a spirit of quest and enquiry in aspiring young men and women. Our professional education must be therefore of a very high order, progressive and dynamic. Only then we could lay claim to equality with other learned professions of the world. Unless and until that is done, any amount of our agitation in other directions will take us nowhere. If this is accepted, the architects of our professional education have to do some serious thinking and not merely follow the beaten track.

India is a nation in the making. She has yet a long way to cover to catch up with other advanced nations in the scientific world. The Government are doing every thing possible "to strive, to seek and to find" her rightful place in the comity of nations. It would be nothing short of betrayal of trust if her sons in any walk of life do not rise equal to the occasion and make her advance in their own humble sphere of work.

So let proper standards be set up in the matter of Veterinary Education. As things stand now, they vary from College to College. We must aim at some standard of uniformity. We must aim at getting our University degrees recognised in other foreign countries as well. This process should be one of levelling up and not levelling down. We realise certain local conditions may make the process extra hard and hazardous. But patience and hard work, keeping the ultimate object always in view, should win in the end. Let it be remembered that it is the standard laid down by the experts in the line, that forms the foundation for the superstructure that we all have in view. Our decision will ultimately affect the common man. Was it not Colton who said "The cottage is sure to suffer for every error of the Court, the Cabinet or the Camp"?

It is true we do require a large army of workers for our National Extension Schemes. We have been adjusting and building up 'annexes' as has been so pithily put by our Prime Minister, in the form of cheaper agencies such as Short-course men, Livestock Inspectors etc., to work in rural areas under the direction of their officers. The situation is being met effectively to the extent possible. But our contention is that the B.V.Sc's

of our land should receive the highest possible education and have all necessary facilities for Post-graduate studies and for specialisation in the several branches of Veterinary Science within this country. A case in evidence is the recent award of the diploma of F.R.C.V.S., to a Professor of the Madras Veterinary College. It speaks well of that institution for the facilities made available to him. It is such standards that we advocate and insist upon. There can be no denying the fact that this question of Veterinary Education in this country can best be solved by the Interim Indian Veterinary Council, which unfortunately still awaits its statutory status though born nearly three years ago. Before they begin to codify and control the conduct of the Veterinary Surgeon of the land, they must be precise with regard to his attainments and requirements. We would therefore appeal to the Government to refer all questions pertaining to the standard of Veterinary Education, uniformity, duration, nomenclature of degrees awarded etc., to this supreme body and insist upon their shouldering the responsibility for giving the necessary advice.

PAY STRUCTURE AND COLLEGE ADMISSIONS

Madras has had a very unique experience this year in the matter of admissions to its Veterinary College. When other professional Colleges in the State had received more than one thousand applications each for admission into their respective institutions it was left to the Madras Veterinary College to record the lowest number *viz.* 242 for 77 seats, which were made available to the State of Madras after reserving 43 seats to some of the adjacent States and other specified interests. Thus the total number of sanctioned seats for the College was 120. Let now the story unfold itself in all its grimness.

A Committee sat for days together for 'selection' of students. But was it 'selection' in the end, let our readers decide. When called for interview, only 212 students responded and out of these, the required number of 77 was selected and asked to join the College on a certain date; but only 40 students joined. A second call of 'Come Ye! Come All!' was sent

urgently to students who were on the 'Reserve' list, but only 22 students responded this time and all of them were naturally admitted. But yet the College fell short by 11 more students. In the meanwhile news began to arrive that all was not well even with the 43 seats set apart for the adjacent States and other specified interests. They could manage to collect only 31 students in all, leaving a deficit of 12 students under their category. The Government was immediately contacted and appraised of the situation and permission was sought to fill up the vacancies from amongst the remaining students who were not selected originally and without observing the thousand and one restrictions imposed with regard to areas, backward communities, scheduled castes and tribes, etc. The permission was readily granted. Even so they were able to collect only 22 students more, thus bringing the final total to 115 as against the sanctioned number of 120 seats. The College is said to be yet short by 5 students at the time of our writing.

Let us now examine the new 'course' called the Pre-professional course, started from this year. There again they sanctioned 120 seats and advertised widely. After going through the same travails, the College was able to collect only 46 students so far. O tempora! O mores! The order of preference of the student population appeared to be the Medical, the Engineering, the Agricultural, the Integrated Medicine and finally the Veterinary College. We could understand the preference to Medicine and Engineering but could not understand the preference to Agriculture, where so far as we know the pay and prospects are definitely poorer. But we were told that private firms dealing in fertilisers, agricultural implements and machinery, tea and coffee plantations, sugar-cane factories, marketing societies, etc., offered attractive scales of pay and that even in government service there were more openings in higher grades than in the veterinary department. Added to that their course of studies was shorter by one year and a quarter. So ultimately the question boils down to the adequacy or otherwise of the pay-structure. Unless the pay-structure of the veterinary profession is made more attractive, the present non-availability of students for

admission will repeat itself in future years as well. What is worse, the more intellectual of the student population are decanted off to other professions, leaving behind the rest to veterinary science. With such shortage in recruitment both in quantity and quality, we wonder if there is any point in telling the world that we are making tremendous headway in animal husbandry matters.

We do not know how the Government views this matter. We do not want to play the role of an alarmist and say the Cauvery is on fire; but we do say the situation is sufficiently serious for Government to take immediate action. The expansion of the College and other developmental schemes will suffer irretrievably, if this poor admission is allowed to persist.

We feel the question does not admit of any argument. There is only one remedy for it and that is the pay-scale of the profession should be immediately revised and widely advertised. They have been asking for Rs. 200 to Rs. 400/-, which to us seems to be quite modest in these days of high-soaring prices. The country is wronged terribly in this matter. There is so much to be done in animal husbandry matters and yet men are not made available in sufficient numbers.

"The worldly hope men set their hearts upon
Turns ashes - or it prospers"

largely depending upon our efforts. Let our national hopes prosper! We appeal to the Government to do the needful in the matter.

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Original Articles

THE EFFECTS OF ENDOCRINAL ACTIVITY ON BODY TEMPERATURE, VAGINAL AND CERVICAL SECRETIONS, AND THEIR APPLICATION IN THE DIAGNOSIS OF FERTILITY/STERILITY IN BUFFALOES

By

CAPT. W. H. DEANE, R.V.F.C.,
and

CAPT. C. S. NAYUDU, R.V.F.C.,
Central Military Veterinary Laboratory, Lucknow.

Introduction

Although a great deal of work has been done on the vaginal and cervical secretions as related to endocrinal activity in the human, and tests and technique have been developed to a very high degree, no advanced study on this subject has been done on animals, particularly in the buffalo.

There is no doubt that there also exists a very close relationship between the secretions of the reproductive tract, ovarian function, and Oestrogenic activity in the buffalo; but the correlation and the assessment of these have presented great difficulties.

These investigations were therefore, undertaken in the course of routine Artificial Insemination work on Military Farms, to find clinical and laboratory methods of diagnosis which could be applied to the study of body temperature and the lower reproductive tract secretions, in order to assess the state of fertility and sterility in this animal.

Vaginal and Anal Temperatures

During Oestrus and Dioestrus Periods.—Before an animal was inseminated its Vaginal and Anal temperatures were taken, to see whether the two temperatures were related in any way to the Oestrus and Anoestrus periods. This was carried out as a routine measure, in all animals which came into heat. Of these, six were selected at random, and their vaginal and anal temperatures were continued to be taken till the next heat period. This control group was not allowed service.

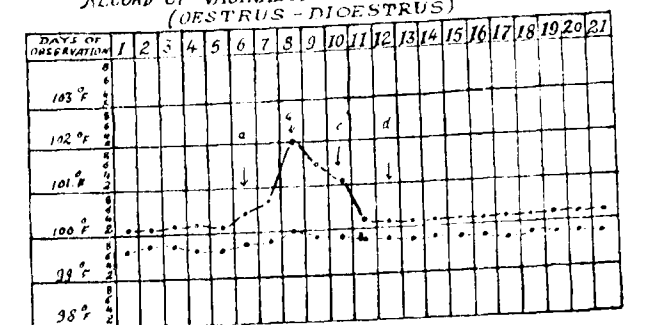
It was observed that two or three days prior to the onset of heat, the vaginal temperature showed a gradual rise of 2 or 3 degrees above the normal body temperature, and thereafter, it continued to persist thus for about 12 hours after the onset of heat. But as the Oestrus

cycle approached its Luteal phase, the temperature gradually dropped to normal, and continued to remain so, till the next heat period. It was during this rise and fall of the vaginal temperature, that the active signs of heat were manifested: *etc.* discharge from the vagina, restlessness, lowing and mounting other cows.

Temperature Chart

FIG. 1 (CHART)

RECORD OF VAGINAL AND ANAL TEMPERATURE
(OESTRUS - DIOESTRUS)



LEGEND: VAGINAL TEMPERATURE —•—•—
ANAL TEMPERATURE - - - - -
a. THE GRADUAL RISE OF VAGINAL TEMPERATURE.
b. THE HEIGHT OF VAGINAL TEMPERATURE AT OESTRUS.
c. THE GRADUAL FALL - LUTEAL PHASE
d. THE VAGINAL TEMPERATURE LEVELS OFF DIOESTRUS

In a certain number of cases when the only symptom of heat present at the time of examination was an oestrus discharge (late heat), the vaginal temperature was the same as the body temperature. (It is now known that in women these variations are due to the influence of the hormones, Progesterin and Oestrin. Progesterin causes a rise in temperature, and Oestrin a fall). The vaginal mucus at this stage was also thick and tenacious and revealed massive cell infiltration. Animals inseminated at this temperature phase of the oestrus cycle have failed to hold. So far 200 animals have been examined. Further experimental work to establish this fact is still in progress.

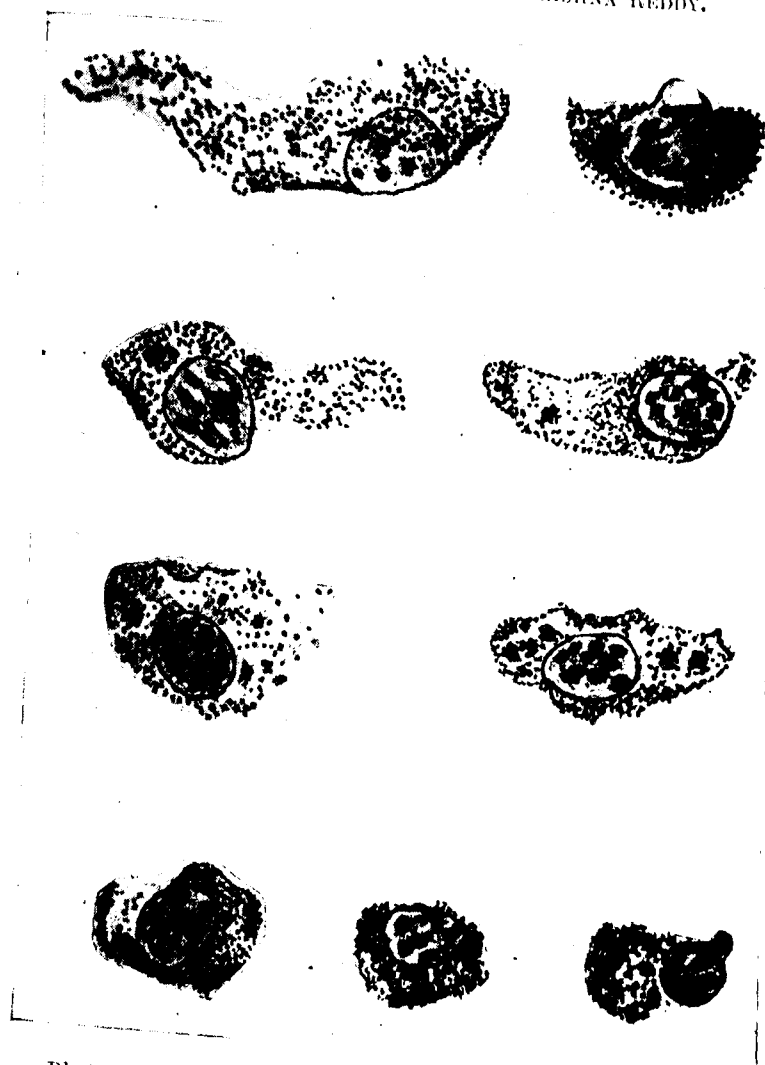
Silent Metritis

During routine Artificial Insemination work, cervical mucus was collected from every animal which came into heat. In every case an Invasion Test was carried out. This test was done by placing a drop of mucus and a drop of semen a little distance apart on a slide. Then a channel of semen was run into the mucus drop. Immediately the sperms on coming in contact with the mucus wall swam vigorously

Some observations on Chronic Earsore in Buffaloes

By

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Photograph of Camera lucida drawings of a few Endothelial cells containing peculiar cellular bodies in their cytoplasm.

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heat. During the course of these investigations, a phenomenon was accidentally observed, and was found more repeatedly in cervical mucus smears. This phenomenon appeared to resemble the Filicineae (Ferns). The pattern was only observed at the edges of the smears, and when study was restricted to the central fields the pattern was not seen. At first, it could not be correlated to any phase of the oestrus cycle; and the significance of the repeated appearance of the fern pattern in cervical mucus—which was clear, had a normal pH value, no leucocytes or small and large epithelial cells—was overlooked and considered to be of no importance. Later, as the experiments progressed it was possible to link the findings with definite phases of the oestrus cycle.

Technique.—Smears were made from samples of uncontaminated cervical mucus, fixed in 95% alcohol, and stained with Crystal, Gentian or Methyl Violet, for 10 to 30 seconds.

Stains.—The following stains were used to stain the cervical mucus smears:—Crystal Violet, Gentian Violet, Methyl Violet, Methylene Blue, Artoli's stain, Brilliant Green, Carbol Fuchsin, Eosin, Giemsa's, Gram's, Haematoxylin, and Leishman's stain. Of these, the Violet stains—Crystal, Gentian, and Methyl—were the only ones which clearly defined the Fern pattern, whereas the others either failed to reveal the pattern, or blurred the outline. In the case of Haematoxylin, it was observed that its original colour was influenced by the pH of the Cervical Mucus. Where the mucus was alkaline in reaction, the smear turned blue; but where it was acid the smear took up a brick red colour.

Unfixed and unstained dry smears also revealed the Fern pattern.

Storage.—Cervical mucus which had been stored at 5 C displayed the Fern pattern even after 6 weeks.

Microphotography.—The Crystal, Gentian, or Methyl Violet stained smears gave better results than the unstained smears.

Observations

(1) Fern pattern and the phases of oestrus.

It was observed that the pattern appeared in the first, second and fourth phases of the oestrus cycle, i.e. from a period of about three days pre-oestrus to nine or ten days post-oestrus. It was absent during the Luteal phase. It was therefore surmised, that this pattern only appeared under the influence of the Oestrogens, but was suppressed during Progesterone activity.

Phase I — Onset of heat to ovulation—3 days. Fern pattern seen; outline well defined.

- Phase II* — Developing Corpus Luteum—5 days—Fern pattern seen—outline coarse.
- Phase III* — Height of Corpus Luteum activity—9 days—Fern pattern not seen.
- Phase IV* — Involution of Corpus Luteum—4 days—Fern pattern seen; outline well defined.

(2) *Pregnant animals.*

Further investigations showed that this pattern disappeared after the fifteenth day of pregnancy. This was evidently due to the continued influence of Progesterone activity during pregnancy.

(3) *Non-pregnant animals.*

In animals which did not hold to service, this pattern reappeared after the cessation of Progesterone activity—which was after approximately 18 days.

(4) *The fern pattern and spermatozoa.*

The Fern pattern can be used to determine whether or not the mucus secretion was favourable to the passage of normal spermatozoa. It was found that the absence of the Fern pattern indicated an unfavourable environment, with consequent hindrance of motility and destruction of the sperm.

Cervical Mucus of Pregnancy

Further investigations led to the examination of the cervical mucus collected from pregnant animals. It was found that the Fern Pattern had been replaced by broad bands of collagen-like fibres, which ran parallel to other like bands, and were seen to extend throughout the smear. These bands were found to be constantly present, from the fifteenth day of pregnancy to the end of term. However, false results were obtained in the presence of Persistent or Cystic Corpora Lutea. This was later confirmed by rectal examination.

Vaginal Smears.—Vaginal smears were found to be unreliable and gave false results.

Summary

These investigations on Cervical mucus have shown, that there exists a definite relationship between the Oestrin and Progesterone phases of the Oestrus cycle, with that of the vaginal and anal temperatures, appearance of the Fern pattern, and the formation of Collagen-like fibres. It is presumed that the presence of these fibres is due more to the Progesterone activity than to the presence of the foetus.

The presence of a non-specific type of Metritis in adult or young stock, hinders the activity of the sperm, thus reducing the possibility of fertilisation.

The above findings can be put to the following practical uses:—

- (i) The correct time to inseminate, taking into account the Fern pattern and the vaginal temperature reaction.
- (ii) The very early diagnosis of pregnancy (15 days) taking the help of the Fern pattern and the Collagen fibre-like bands present in the Cervical mucus.
- (iii) The extent of Oestrogen and Progesterone activity.
- (iv) The diagnosis of Persistent or Cystic Corpora Lutea.

The Cervical mucus test presents a number of future possibilities, but a great deal of research work has still to be done. At this stage the method cannot be recommended for the definite diagnosis of pregnancy and other conditions.

STUDIES ON *KLEBSIELLA PNEUMONIAE* INFECTION IN CHICKS

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A high percentage of mortality amongst developing chick embryos and baby chicks, has been encountered by workers in India. Studies were, therefore, initiated sometime back at this Institute on the probable etiological factors, bacteriological or otherwise, with a view to developing suitable control measures for preventing the high monetary losses suffered on this account by poultry breeders in India. Limited observations on it have already been published by Sethi, (1955). The object of this paper is to record the occurrence of an organism, serologically indistinguishable from *Klebsiella pneumoniae* type 3, in the unabsorbed yolk of a chick that died 5 days after hatching. The material was received in the form of yolk in a sealed pipette from the Superintendent, Lam Farm, Guntur, with a request for examination for Salmonellosis.

Preliminary bacteriological examination of the material resulted in the isolation of a Gram-negative, lactose-fermenting capsulated, rod-shaped organism which was found to be pathogenic for white mice as well as for developing chick embryos and 3-5 days old chicks. The detailed characteristics of the organism are recorded below:—

Morphology and staining.—In culture, the organism was highly pleomorphic. The usual form was a short thick oval rod, 1-2 μ long

and 0.5–0.8 μ broad, with a straight axis, parallel or bulging sides and rounded ends. The organisms were arranged singly but more often in pairs end to end; curved rods, sausage forms and other involution forms were found in cultures. In the body, the diplo-bacilli, arranged in pairs, end to end, not unlike pneumococci, were found to be the commonest. They were Gram-negative, non-acid fast, non-sporing and non-motile. The capsules were demonstrable even in culture smears in wet India ink preparations or when stained by Stern's modification of Muir's method or Alcian blue technique (Novelli, McKinney, 1953). Limited studies on the chemical structure of the capsule revealed that it contained a nitrogen-free polysaccharide of a reducing sugar, probably glucose. That it was a polysaccharide, was evident indirectly by its staining with Alcian blue, poor antigenicity and its susceptibility to hydrolysis by mild alkali.

There was no liquefaction of gelatin, but a characteristic circular, convex, surface growth with a filiform growth along the needle track resembling a round-headed nail was observed. The occurrence of a napiform gas bubble near the surface or along the line of stab was a peculiar feature. There was no haemolysis on agar containing 5 per cent horse, ox, sheep, goat, fowl, rabbit or guinea-pig blood but slight browning of the medium was observed by about the 7th day. No soluble haemolysins could be demonstrated in liquid media. On MacConkey's agar, the organism gave rise to typical reddish colonies in 24 hours. On further incubation the colonies became raised, mucoid, creamy-yellowish with slightly nodular surface. In MacConkey's fluid medium as well as in Robertson's cooked meat medium, marked turbidity with gas formation was seen. In glucose-agar shake cultures, multiple colonies, more numerous near the top, were observed and the medium was torn into rifts with gas. There was no liquefaction of serum but abundant growth with buff-yellow chromogenesis was observed. On potato slants tendency to form a brown pigment was noticed.

Metabolism.—The organism was an aerobe and under strict anaerobic conditions very little growth occurred even after incubation for 10 days at 37°C. Under aerobic conditions it grew well at 37°C as well as at 22°C on all ordinary media. Cultures were killed by moist heat at 55°C for 30 minutes but they remained alive at room temperature for more than a month.

Biochemical reactions.—The techniques and methods used in biochemical examination of this strain were those of Kauffmann (1954), Møller (1954) and Kauffmann and Møller (1955).

The strain was indole-negative, M. R. Positive, V. P. negative, citrate-negative, KCN test-positive, urea-positive. It fermented inositol, adonitol, lactose, glucose, and mannitol with production of acid and gas in 24 hours. It was glycerol-negative in 24 hours. The amino acid

decarboxylase pattern was glutamic acid-negative, lysine-positive, arginine-negative and ornithine-negative. It was capable of utilising d-tartrate, sodium citrate, and sodium mucate. The detailed results of biochemical examination are set out in Table I.

TABLE I
Biochemical Reactions.

Type of substrate.	Chick strain	<i>Klebsiella pneumoniae</i> type 3 strain (NCTC 5646).	Type of substrate.	Chick strain	<i>Klebsiella pneumoniae</i> type 3 strain (NCTC 5046).
Glucose	++ ¹	++ ¹	Ammonia	+ ⁵	+ ⁵
Mannitol	++ ¹	++ ¹	Indole	+ ¹	— ⁶
Adonitol	+ ¹	+ ¹	M. R.	— ⁴	+1, 2, 4
Dulcitol	— ³⁰	+ ²⁰	V. P.	+ ²	—2, 4
Sorbitol	+ ¹	+ ³	Nitrate Reduction	+1, 4	+1, 4
Inositol	++ ¹	++ ¹	H ₂ S.	— ³⁰	— ³⁰
Glycerol	Negative in 24 hours	Negative in 24 hours	KCN test.	+	+
	+ ³ .	+ ³ .	Organic acids.		
Lactose	++ ¹	++ ¹	d-tartrate	+ ¹	+ ¹
Sucrose	+ ¹	+ ¹	Sodium citrate	+ ¹	+ ¹
Salicin	+ ¹	+ ³	Sodium mucate	+ ¹	+ ¹
Xylose	+ ¹	+ ¹	Decarboxylases.		
Arabinose	+ ¹	+ ¹	Lysine	+	+
Maltose	+ ¹	+ ¹	Arginine	—	—
Rhamnose	+ ¹	+ ³	Ornithine	—	—
Trehalose	+ ¹	+ ⁷	Glutamic acid.	—	—
Urea	+ ¹	+ ¹			
Ammonium citrate.	— ⁴	+ ³			

Key: ++ = Acid and gas, the number following indicates the day on which the "sugar" was found fermented.

+ = Acid, no gas.

— = Negative.

Serology.—The technique and methods used in serological examination were those of Kauffmann (1954).

Cultures of *Klebsiellae* types 1–8 were obtained from the National Collection of Type Cultures, London, and K-anti-sera were prepared in rabbits on the lines of Edmunds (1954). Type determination was done on the basis of capsule-swelling and tube agglutination tests with pure 'K' sera as recommended by Kauffmann (1954).

To confirm the results, agglutination tests were done by the slide method using living agar cultures as antigen. The chick strain gave a tube agglutination titre of 1:64 and specific capsule swelling with

Klebsiella pneumoniae type 3. The results of the above tests are presented in Table II.

TABLE II

Capsule type determination.

Results of tube agglutination test and capsule-swelling test (modified according to Kauffmann).

Capsule Type	1 2 3			K. Sera.					Pn. 2	Earlier designation
	KA	KA	KA	KA	KA	KA	KA	KA		
Chick Strain	-0	-0	+64	-0	-0	-0	-0	-0	-0	Type 3 (C)
<i>Klebsiella pneumoniae</i> type 3	-0	-0	+128	-0	-2	-0	-0	-0	-0	C
NCTC 5046										

Key:—K = Capsule swelling.

A = Agglutination titre tube, expressed in reciprocal of dilution of serum.

Pathogenicity.—The pathogenicity of the strain was tested by intra-peritoneal inoculation of white mice (18-20 gms.) with 0.2 ml. of undiluted and of ten-fold dilutions of 24 hour plain broth cultures. The mice were observed for 14 days (Brooke, 1951). The minimum lethal dose for the mice was found to be 1 ml. of a 10^{-7} dilution of a 24 hour old nutrient broth culture given intraperitoneally.

In addition, pathogenicity trials were conducted on embryonating hen's eggs (8-12 days) and chicks of 3-4 days and 10-12 days as well as on adult birds. The chicks and adult birds were infected with 0.5 ml. and 0.25 ml. of a 24 hour old broth culture subcutaneously and intraperitoneally respectively. The eggs were infected by dropping the culture on the chorio-allantoic membrane as well as by inoculation into the allantoic cavity and yolk-sac with 0.1 ml. of a 1:100 dilution of 24 hour old broth culture. They were observed for 14 days. The younger chicks and the embryos died during the course of 24 hours whereas the adult birds survived. The results are given in Table III.

TABLE III

Results of exposure of eggs to *Klebsiella pneumoniae* type 3.

Results of exposure of eggs to <i>Klebsiella pneumoniae</i> type 3.									
Sl. No.	Source & history.	Type of organism used.	Results of exposure of eggs (8-12 days) to <i>Klebsiella pneumoniae</i> type 3.						Remarks.
			Chorio-allantoic membrane. 0.01 c.c.		Yolk sac 0.01 c.c.		Allantoic cavity 0.01 c.c.		
1	Specimen No. 181/55	<i>K. pneumoniae</i> type 3	D ⁶	D ²⁴	D ²⁴	D ²⁴	D ²⁴	D ²⁴	
	Result of bacteriological examination.		+	+	+	+	+	+	By smear and culture.

Key:—D = Death within 24 hours.

Key:—D = Death with the number indicating the hours after which the embryo died.
+ = Positive.

TABLE IV

Results of exposure to chicks to *Klebsiella pneumoniae* type 3.

Sl. No.	Source & History.	Type of organism used.	Results of exposure to chicks to <i>Klebsiella pneumoniae</i> type 3, by Subcutaneously 0.5 c.c. intraperitoneally 0.25 c.c.			
			Chick I (3-4 days)	Chick II (12 days)	Chick III (3-4 days)	Chick IV (12 days)
1	Specimen No. 181/55	<i>K. pneumoniae</i> chick strain	D ⁶	S ²⁴	D ⁶	S ²⁴
		Results of Bacteriological examination	+	Alive after 7 days.	+	Alive after 7 days.

Key: D = Died with the number indicating the hours after which death occurred.

S = Survived.

+ = Positive by smear and culture examination.

Discussion

The isolation of *Klebsiella pneumoniae* type 3 from the unabsorbed yolk of a chick that died 5 days after hatching as well as the success achieved in reproducing the disease both in embryonating hens' eggs and young chicks resulting in the production of specific lesions and death show the pathogenicity of the organism for birds. It would be of interest to pursue this work with a view to studying the frequency of occurrence of this organism in young chicks and to find out the extent to which it may be responsible for losses in young chicks and developing embryos.

Organisms of *Klebsiella* (capsulatus aerogenes) group appear to lead a parasitic existence and have been isolated from cases of pleurisy, cystitis, pyelonephritis, infectious enteritis, pericarditis, ulcerative endocarditis, brain abscesses and general septicaemia in man. The strains of *Klebsiella* that were isolated from cases of metritis in mares (Edwards, 1928) and mastitis in cattle and swine (Barnes, 1954); (Easterbrooks and Plastring, 1956) were found to belong to types 2, 4, 6, 17, 19, 31, 33 and 35 and the strains recovered by Dhanda *et al.* (1956) and Plastring *et al.* (1956) from cases of meningo-encephalitis in dairy calves to type 25 but none of the strains of *Klebsiella* were proved to be type 3. *Klebsiella* strains have also been reported recently as occurring in the sputa and faeces of normal infants (Ørskov, 1955) and as occasional inhabitants of naso-pharynx, which raises the possibility of a human source of infection. However, we are not in a position to suggest the possible and probable routes of infection, as no reliable data are available even at the source. It is possible that adult birds act as carriers of the organism and the infection is conveyed to developing chicks as well as to very young

chicks after hatching. This view can, however, get due recognition only if attempts at isolation of the organism from adult birds meet with success.

Summary

1. The occurrence of *Klebsiella pneumoniae* type 3 in the unabsorbed yolk of a chick that died five days after hatching is reported. The morphological and cultural characteristics and biochemical and serological reactions of the organism are described.

2. Pathogenicity tests carried out with the organism on the developing chick embryos, young chicks upto ten days in age and adult birds have indicated that the organism is pathogenic to the first two, but not to adult birds.

3. The possible role of the organism in causing mortality in young chicks and chick embryos is discussed.

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SOME OBSERVATIONS ON CHRONIC EAR SORE IN BUFFALOES

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1. *Introduction*:—Two forms of chronic skin diseases have been described in India so far in which filarid worms have been incriminated as the cause of the trouble. Pande (1935) had succeeded in demonstrating *Stephenofilaria assamensis* in hump sore in cattle and their microfilaria in the local lesion. Das (1955) claims that out of 4058 clinical and sub-clinical cases of hump sore, he could demonstrate microfilaria of *Stephenofilaria assamensis* in 399 cases. Gopalakrishnan (1951) described a chronic skin lesion on the inside of the ear in buffaloes in Assam in which he had encountered *Stephenofilaria* species and its microfilaria which he found to be morphologically identical with *Stephenofilaria assamensis*. The authors of the present paper had the occasion to investigate an extensive outbreak of chronic ear sore in buffaloes reported by Veterinary Surgeon i/c. Hospital, Parbhani in which microfilaria have been encountered. Following this we have been able to identify the disease in the other parts of the Province, viz. Nizamabad, Sangareddy and Hyderabad.

2. *Description of the Disease*:—The disease was first encountered in the month of December, 1955. A few animals were receiving treatment at the hospital. A search was made to find out the extent of the infection in the locality and over 200 animals were found suffering in the town proper. Individually all the animals were examined and different stages of development of lesions were noted and studied. The earliest lesion appeared like a few mosquito bites in the middle third of the inside of the external ear. Each spot on examination revealed a central dark red spot surrounded by a zone of congestion. From this early lesion it appeared that the trouble extended towards the base of the ear. In more advanced cases a thin scab looking like dried blood which might have oozed out from the lesion appeared. At this stage the animal developed an itching sensation and was found to shake its head frequently and occasionally rub the ear against objects to alleviate the irritation. In such cases an oedematous swelling at the base of the ear was a very prominent symptom and the actual

lesion itself was found to be either more moist with exudate or with a thick crust of dried up discharges. When such an ear was held in the palm of the hand and ear lobe opened for examination, it was found that the layers consisting of dried discharge covering the lesion cracked. In much more advanced cases the lesions became purulent, got fly-blown and in grossly neglected cases, maggots were also found. At this stage the lesion may have extended upto the external auditory meatus, covered with thick creamy pus like material. Such animals lose condition because they cannot feed as usual but keep their head shaking to avoid flies and itching sensation.

3. *Laboratory Findings*:—Smears were made from the deep scrapings of the lesion and these were stained with Romanowsky stains. Besides secondary invaders like Cocci and Fungi, Microfilaria were encountered on an average in 10% of the cases examined. Simultaneously blood smears were also made from the cutaneous blood for the presence of microfilaria in general circulation. Whereas the smears of the local lesions of some cases were positive for microfilaria, the peripheral blood smears of the same patients were negative for them. From this it is gathered that the microfilaria are localised in lesions and not in general circulation.

4. *Peculiar "Cellular Granules" in Lesion Smears*:—We have examined over 200 to 300 specimens of scrapings of ear lesion. Whereas 5 to 10% of specimens were positive for microfilaria; in about 90 to 95% of the smears endothelial cells containing in their cytoplasm dark lilac stained granules numbering from 100 to 1000 were encountered. These cellular granules were, in their morphology and colony arrangement within the cytoplasm of the cells, simulating Rickettsia, as may be seen in plate. We sent our preparations to Professor Henning of Pretoria University, South Africa and he was of the opinion that these might not be Rickettsia and that he was unable to make out what these granules were. We are of the opinion that these are not elements of disintegrating cells because the nucleus of the infected cell is entire and the granules occur only in the cytoplasmic expansion of the cell. The significance of the presence of these granules is not yet manifest to us.

Technique of Making Smears:—When we examined the smears received from the field staff we found that the smears were made of pus and discharges and microfilaria were not encountered but were found to contain lot of bacteria, dead tissue and grease. So we adopted a technique for getting satisfactory smears. The lesions were dry cleaned with cotton wool until all easily detachable discharges and tissues were removed. With a blunt scalpel the lesion was then scraped lightly till a little blood oozed out. This was discarded by wiping the scalpel with

cotton wool. The lesion was once again scraped deeply and the blood mixed scraping thus collected was spread evenly on slides, air dried and stained by Romanowsky stains. Only smears made thus yielded satisfactory results.

Vectors:—The herds were visited both during day time and at dusk. During day time only the domestic flies were found to feed on the discharges of the sores. During evenings and early part of night, blood sucking vectors were seen. These were caught and sent to Zoological survey of India for identification. In their reply they mentioned that the vectors belonged to the *Psychoda* species (Sand flies). They could not give specific identification because the specimens when received by them were found slightly damaged.

Host specificity:—Ears of livestock other than buffalo species have also been examined for evidence of this trouble in them and except buffaloes no other species of domesticated animal was found suffering although they were living in close contact.

Treatment:—The lesions were dry cleaned and oleaginous dressings containing boro-iodoform were applied in the beginning. After finding microfilaria in the lesions the field staff were advised to try antimony tartaratum or anthiomalin. Results obtained were very satisfactory during the period of treatment, but once the treatment was stopped, there was a tendency for the lesion to become active once again after a lapse of 4 to 6 weeks.

Discussion:—It was evident from the literature consulted that the cutaneous lesions produced by microfilaria could be classified as one occurring in cattle and the other in buffaloes. Pande (1935) recovered adult worms from the local lesion in hump sore cases and he identified the worm as a new species and named it *Stephenofilaria assamensis*. In his publication, Pande mentioned that he saw the microfilaria in the local lesions whereas Das (1955) found the filarial larvae in about 10% of cases in peripheral blood. These observations refer to hump sore in cattle only and to no other species. Gopalakrishnan (1951) described microfilaria in the local lesions of the ear and he could recover the adult worm also from the affected site and identified it as belonging to *Stephenofilaria assamensis* because hump sore is a disease of cattle and ear sore is a disease of buffaloes. While describing the topography of the seats of outbreak he mentioned that the disease was more common in villages situated on banks of rivers having marshy low lying grazing lands and pools where buffaloes graze and lie down for rest in stagnant waters, for the hot part of the day. In our investigation of the first outbreak in Prabhani district we found that the local conditions were entirely different from those described in Assam province. Prabhani is a dry

district and marshy and low lying lands are not met with and the whole area is a black cotton tract with no wet cultivation. Our search for the adult worm in the lesions has not met with success so far although about 10% of cases showed microfilaria in the local lesions. The significance of the occurrence of cellular granules in colonies after the fashion of Rickettsia in the cytoplasm of the endothelial cell is yet to be understood in relation to the etiology of this condition because these affected cells occur fairly frequently in the lesion smears amounting to 90 to 95% of the specimens examined.

The presence of Psychoda species which are nocturnal vectors in and around the herds of buffaloes is significant in the elucidation of the aetiology and spread of this chronic disease. Further work on the vector problem and recovery and identification of the adult worm is being pursued and results obtained will be the subject matter of a separate record.

Summary

Brief resume of the data available regarding cutaneous filariasis is given. Symptoms of the disease, treatment and vectors encountered have been detailed.

Microfilaria in 10% of cases examined and peculiar cellular bodies in 90 to 95% have been described.

Domestic flies and Psychoda species (sand flies) have been found to be the only arthropods occurring in and near about the herds.

The disease is one of buffaloes only and no other domesticated animal living in close contact was found infected.

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General Articles

MELANOMATA IN BUFFALOES

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Introduction.—Melanoma has been reported in several species of domesticated animals, fowls, and fishes but its incidence varied in the different species. It has been found to be most frequent in aged grey horses, less frequent in oxen and of rare occurrence in buffaloes. Venkatesa Iyer (1925) reported a case of melanosarcoma on the neck of a she-buffalo. In a survey of the incidence of animal neoplasms in the Madras State from 1940-51, Chandrasekharan Nair and Sastry (1954) found only two cases of melanomata in buffaloes, one situated on the eye and the other on the abdomen. The paucity of reported cases in buffaloes suggests that these animals are seldom victims to this neoplasm and hence a case of malignant melanoma noticed in this species is reported.

Incidence.—In the course of examination of 4,000 buffalo cadavers in the Bareilly abattoir, a case of multiple melanomatosis was noticed in a nondescript she-buffalo aged about 10 years.

Macroscopic pathology.—There were two large, irregular lumpy growths on the floor of the pelvic cavity, one on either side of the pelvic symphysis. The growth on the left side measured 20.6 cms. in length, 13.4 cms. in width and 8.5 cms. in thickness and weighed 2,000 gms. (Fig. 1) while the one on the right side measured 13.8 cms. x 12.5 cms. x 5.6 cms. and weighed 570 gms. On sagittal incision, each lumpy mass was found to consist of several black melanotic growths, varying in size from a grape to an apple, surrounded by abundant fibrous tissue and a little pelvic fat. Extensive grape-like clusters of melanotic nodules, varying in size from a mustard seed to a millet seed, were present on the parietal layer of the pelvic and abdominal peritoneum (Fig. 2) broad ligament of the uterus and in the subcutaneous tissue and musculature in the perineal region while stray nodules were present on the serous surface of the right uterine cornua and on the mucosa of the vagina and urinary bladder. Several melanotic growths, varying in size from a pea to a grape, were present on the surface and in the parenchyma of the liver. The lymph nodes situated in the roof of the abdominal cavity were considerably enlarged. Gross examination did not reveal any visible growth on the surface of the skin, either in the perineal region or elsewhere. The clusters of neoplastic growths on the peritoneum were

Melanomata in Buffaloes

By
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largely smoky-grey in colour while those in the liver were jet-black but the large growths in the pelvic cavity and the enlarged abdominal lymph nodes were found to be black in colour only on incision. The red bone marrow in the ribs and vertebrae showed either patchy or diffuse blackish discolouration.

Microscopic pathology:—The neoplasm was highly cellular and contained variable amounts of fibrous stroma. The melanoblasts were fairly large, polyhedral in shape and closely arranged in solid masses surrounded by thin strands or thick septa of collagenous fibrous tissue which gave an alveolar appearance (Fig. 3). In some areas, the cells were diffusely distributed with little stroma and the alveolar arrangement was indistinct. The cytoplasm of the melanoblasts was acidophilic. The nucleus was large and occupied nearly half to three quarters of the cellular bulk. It was spherical or oval in shape and vesicular in appearance. The nucleolus was also large and often multiple. Mitotic figures were commonly seen.

The distribution of melanin pigment was very irregular and it varied even in different fields of the same section. A very large proportion of the cells were amelanotic, even in growths that were frankly black on gross examination, while in a few areas dense accumulation of pigment was noticed within the melanoblasts as well as in the stroma. The intracellular pigment was in the form of fine, light brown granules and when present in excess, completely filled the interior of the cell and masked the finer details of the cell structure. The extracellular pigment occurred in the form of coarse dark brown clumps, lying either free in the stroma or engulfed by phagocytes.

Blood vessels were thin walled and occasionally extravascular blood was found to be in direct contact with the tumour cells. In some of the sections, emboli of neoplastic cells were noticed in the blood vessels. Small areas of necrosis were noticed here and there.

Although no visible growth could be detected on the skin in the perineal region, microscopical examination revealed dense accumulation of melanoblasts in the dermis extending into the epidermis above and musculature below. The epidermis was thin in some places while in adjacent areas elongated downward projecting columns of stratified squamous epithelium were seen (Fig. 4). Diffuse collections of melanoblasts were seen infiltrating into the skeletal muscles of the perineum resulting in their fragmentation and atrophy. The degenerated muscle fibres were intensely eosinophilic and homogenous due to loss of striation and the nuclei were pyknotic as in Zenker's degeneration.

In the liver there was a marked cloudy swelling with stray foci of lymphocytic infiltration in the portal tracts. Several layers of hepatic



Fig. 1. Left pelvic growth incised to show multiple, pigmented large melanotic growths.



Fig. 3. Showing alveolar arrangement of melanoblasts. H & E (X 80)



Fig. 2. Right pelvic growth (marked X) with a portion of parietal peritoneum showing clusters of small amelanotic nodules.



Fig. 4. Showing melanoblasts invading the epidermis. H & E (X 80)



Fig. 5. Showing lumen of Haversian canal distended with melanoblasts. H & E (X 256)

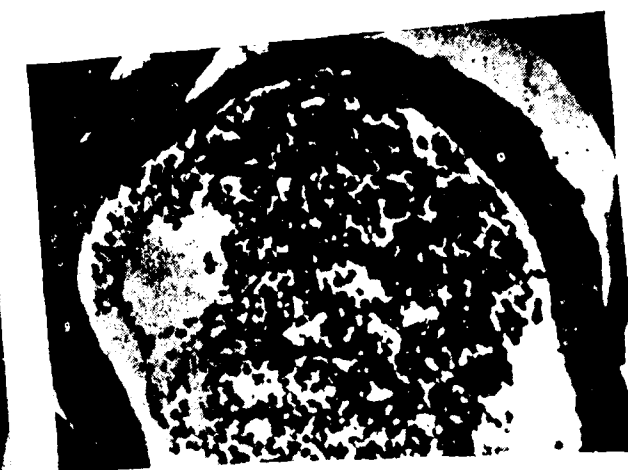


Fig. 6. Showing capillaries packed with melanoblasts. H & E (X 256)

Etiology of Clinical Forms of Goat Mastitis in West Bengal

By

A. MUKHERJEE AND M. S. DAS.



Goat suffering from chronic Staphylococcal mastitis.

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SHRI P. R. KRISHNIE, G.M.V.C.,
an eminent Pathologist and Research Officer
whose sad demise we recorded in our previous issue.

cells at the border of the tumour were atrophied and flattened and gave an appearance of a pseudo-capsule. In the vagina and urinary bladder, the normal epithelium lining the mucosa was replaced by circumscribed collections of melanoblasts which showed a tendency to extend downwards into the musculature. The lymph nodes in the sublumbar region were so heavily infiltrated with diffuse collections of melanoblasts that in some nodes all that was left of the lymphoid tissue was only stray collections of lymphocytes. The lumen of the *Haversian* canal in the compact osseous tissue was considerably widened and contained melanoblasts (Fig. 5). The cancellous spaces in the spongy bone were also filled with melanoblasts and there was little trace of the normal erythropoietic and myelopoietic tissues (Fig. 6).

Discussion.—The subject of melanomata has aroused considerable interest on account of the disputed histogenesis of the melanoblast and the marked colour predisposition exhibited by certain species of animals to the incidence of the neoplasm. Several theories have been put forward regarding the genesis of the mammalian pigment cell. In recent years, its origin has been linked with a transitory embryonic structure, "the neural crest." While reviewing the experimental evidence on which the "neural crest" hypothesis is based, Rawles (1953) emphatically observed that "the old and often heated controversy over the origin of the vertebrate pigment cell may be considered at long last to have come to end."

The unique predisposition of grey horses to melanomatosis has long been recognised. Van Dorssen (cit. Feldman, 1932) who made an extensive study of the incidence of melanotic tumours in horses concluded that all old grey horses were affected. McFadyean (1933) observed that no grey horse would escape from this neoplasm if allowed to live long enough and die of old age.

Melanoma has also been found to be more frequent in grey mules. One of the two mules reported by Runnels and Benbrook (1941) and three out of five mules reported by Mangrulkar (1944) were found to be grey in colour.

In goats, Jackson (1936) observed that melanomata were not encountered in those other than white.

MacCallum (1941) observed 10 melanomata in white persons out of 12,000 necropsies in which the proportion of negroes was high. Anderson (1948) stated that the relative incidence of melanomata in white group was about four times that of the negro. Clark and Macdonald (1953) found the incidence of melanomata in negroes to be only 3% out of a total of 298 cases in Texas and even these were found to develop primarily in parts of the body having the least pigment. Willis (1946)

remarked that there was no sound evidence for the impression that dark skinned races were relatively exempt from melanomata but the above observations show that colour predisposition to melanomatosis is prevalent in human beings also.

Mangrulkar (1944) was of opinion that bovines do not exhibit any colour predisposition to melanomatosis. Head (1953) found subcutaneous melanomata to be more frequent in dark skinned cattle while Imminger (cit. Feldman 1932) observed that melanotic tumours were more frequent in albino than in dark cattle. Chandrasekharan Nair and Sastry (1954) also found that out of 20 cattle, for which colour details were available, all were grey with the exception of two cases. The infrequency of melanomata in buffaloes, which possess a highly pigmented skin, is a phenomenon analagous to that observed in the negro, the coloured horse and the coloured goat. Its rarity in buffaloes might therefore be ascribed to the prevalence of similar colour predisposition in them as has been observed in human beings, horses and goats. However, in view of the contradictory observations reported in cattle, the problem of colour predisposition to melanomatosis in this species merits further investigation.

Melanotic tumours are considered to be rarely malignant in bovines (Feldman 1932). The extensive distribution of the growths involving the peritoneum, liver, lymph nodes and osseous tissue together with the histological appearance of melanoblasts which were highly anaplastic and amelanotic revealed the extreme degree of malignancy of this neoplasm in the buffalo. Further, the involvement of lymph nodes and the presence of emboli of neoplastic cells in blood vessels indicated that dissemination of the neoplasm had taken place through both lymphatics and blood vessels.

Some of the growths in the pelvic cavity and abdominal lymph-nodes were deeply pigmented and appeared jet-black in colour on gross examination but on microscopical examination the melanoblasts were found to be largely amelanotic. Clinical diagnosis of such pigmented melanomata as benign growths, based on gross examination alone, should be attempted with caution and must always be accompanied by histological examination to determine the malignancy or otherwise of these neoplasms.

Giant cells have occasionally been described in melanomata (McFadyean, 1933) but they were not noticed in the buffalo. The observation of Spitz (1948) that giant cells were more frequent in juvenile melanoma than in the adult might explain their absence in the buffalo as the neoplastic growths were obtained from an aged animal.

Summary

1. A case of malignant melanoma in a she-buffalo is reported.
2. The macroscopic and microscopic appearances are described.
3. The problem of colour predisposition to melanomatosis is discussed.

Acknowledgment

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A FIELD METHOD FOR DETECTING TREMATODE EGGS PARTICULARLY SCHISTOSOME EGGS IN CATTLE FAECES

By

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Tropical climates and also warm summers in other climates present special difficulties to the Veterinarian who has to carry out examinations for eggs of helminths. No time must be lost after collecting the specimens from the subject and the examination must be made very soon afterwards, as a large proportion of the eggs of Strongylidae hatch in a short time and the results of an egg-count consequently become unreliable.

If there are only a few specimens to examine, these may be preserved at the time of collection and may be examined later on in the laboratory. But if mass examinations have to be carried out such as are required for the establishment of control plans, the preservation becomes out of question. Therefore we have decided to examine the specimens right on the spot in the field. However, field work sets a limit to the equipment and techniques which can be used, for especially on bad country roads, costly equipment cannot be carried and only a small selection of chemicals can conveniently be carried in a car.

Therefore we have been using the saturated salt solution for flotation method for detecting the eggs of low specific gravity and in special cases the McMaster counting chamber. For eggs of high specific gravity we have been using the simple sedimentation method. We searched for larvae by the Vajda method. Our method in detecting light eggs has proved satisfactory, but we have been disappointed with the results of the sedimentation method.

From our post-mortem statistics on cattle we have learnt that the carcasses were infested with Trematodes as follows:

about 60%	with	Paramphistomidae.
" 20%	"	Fasciola spp.
" 30%	"	Schistosoma spp.
" 10%	"	Eurytrema spp.

On the other hand the statistics obtained from our examinations of faeces by sedimentation were as follows:

about 30%	infested with eggs of	Paramphistomidae.
" 20%	"	Fasciola spp.
" 0.5%	"	Schistosoma spp.
and no eggs of Eurytrema spp.		

Although it would not be fair to compare these two statistics in their entirety, the difference was of such an extent that we were led to suspect that the sedimentation method was not giving us an accurate assessment of the true incidence of infestation especially with regard to eggs of Schistosoma and Eurytrema. When the faeces of dead animals were examined, positive results were not obtained for eggs of the above two parasites although we knew by examinations of the intestines that these parasites were present. Therefore we had every reason to look for some other simple method which would bring us reliable results.

We then tried several techniques especially for detecting eggs of schistosoma and finally we chose the Telemann-method (to stir the faeces with an 18% hydrochloric acid solution, later adding ether, shaking the mixture, centrifuging it and examining the sediment). In cases where we knew the composition of the helminth population, we found in the faeces of these animals, by using this method, the following Trematode eggs:

Paramphistomidae	100%
Eurytrema spp.	50%
Fasciola spp.	25%
Schistosoma spp.	25%

But this method obliged us to carry with us on our travels a centrifuge and ether. With the temperature above 30°C in the shade, for the greater part of the year, this was a hopeless undertaking because when we wanted to use the ether most of it had evaporated and therefore this method proved to be costly and complicated.

Now we had to try and to find out other liquids which could be used as a practical substitute for the ether. We made trials with various liquids of both high and low specific gravity, trying to get the same effect as with the Telemann method. Finally we arrived at the following methods:

Technique of the method: 2 to 3 gram of faeces stirred in a mortar with 10 cc. of a solution of nitric acid 58% by volume (58 parts of nitric acid (specific gravity 1.40) to 42 parts of water by volume).

This mixture is sieved through a piece of mosquito netting into a centrifuge tube.

and very much less in value than the carcase, it is perhaps natural that the Flayers should pay greater attention to make the meat look attractive than to producing a first class hide or skin. Again it is the poverty of the butcher that makes him to use any steel plate instead of investing a little money on a good knife. Traders in hides and skins are also to be blamed for fixing the price merely on the basis of weight and not on the quality of work done also. This tempts the butchers to increase the weight with blood and excreta suitably mixed with hide, not realising the harm done through this practice.

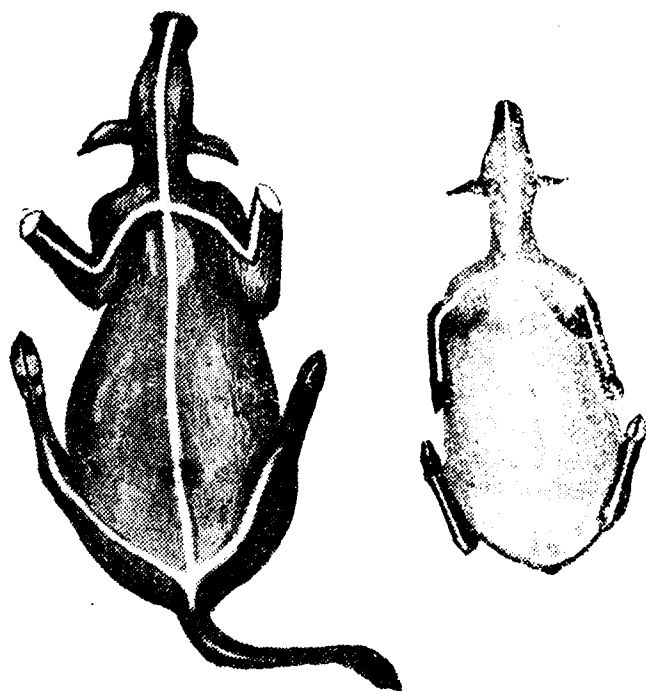


Fig. 1 (Cattle)

Correct lines to follow in ripping.

Fig. 2 (Sheep)

Scientific Flaying:—A well flayed hide is nicely squared and symmetrical in shape. The flesh side is clean with no trace of knife marks, holes, cuts or gougings. The following is a guide to the correct flaying of a hide. A sharp knife should be used. The bleeding cut should be made in a perfectly straight line between the breast and throat. A cross cut will spoil the shape of the hide and decrease its value. The opening cut must be made with the greatest care. Fig. 1. will make it necessary for the tanner to trim off parts of the felt before tanning. The parts so removed cannot be used for any purpose except

for glue manufacture, for which their value is very much less than when used for leather. After the opening cut has been made, the knife must be used very carefully to avoid cuts and holes; "Niggling" with the point of the knife should be avoided as it produces bad results. Care should be taken in removing the tail bone and root, as hides may be damaged during this operation. The legs should be cut off at the knee and the hock joints and the horns, skull and muzzle should also be removed. If flaying has been done properly there should be the least quantity of fat and flesh adhering to the hide.

Calf Skins:—Being much thinner and more delicate they are easily damaged. Greater care is required for them. The less the knife is used the better would be the result. Fisting can be done to advantage. The lines of ripping are the same as those for hides; calf skins should be flayed without the head.

Sheep Skins:—A properly flayed sheep skin should be square in shape. Fig. 2. gives the lines for ripping. The knife should be used as sparingly as possible. The rest is done by fisting. In the case-on method open out the skin and allow to cool.

Goat skins:—Use the knife as little as possible. If done by the case-on method, open out the skin and allow to cool.

Suggestions for improvement

1. **Slaughtered Hide:**—
 - (a) **Slaughter House:**
 1. A lairage with shade and plenty of water should be provided for the animals to rest.
 2. The slaughter hall should be of the "booth system" and should not be an open hall.
 3. The animals should be brought into the hall one by one and then slaughtered.
 4. Each animal should be carefully and quickly cast and slaughtered. In no case should an animal see another being slaughtered.
 5. Some method of stunning should be adopted in the slaughter house, prior to slaughter proper.
 6. The floor of the hall should be hard, non-slipping and easily cleansible.
 7. After slaughter the blood should be carefully collected and not allowed to mix with the hide and alimentary contents. Each booth should have a blood channel.
 8. The intestinal and ruminal contents should not contaminate the hide. There should be separate rooms for guttery and tripery operations, and the guts and tripe should be carried in wheel barrows to those rooms.

9. Each animal should have a hoisting apparatus; if possible a flaying bed and tail extractor also.

10. There should be plentiful supply of water for washing and cleansing of hides and skin.

11. A separate room should be kept for hides and skins to be stored or cured and stored. It would be ideal if this room has cold storage facilities.

12. The slaughter house should be well lighted, ventilated and have fly-proof arrangements and the walls should be of glazed tiles to facilitate easy cleaning.

(b) *The animal to be slaughtered.*

1. Should be allowed to have rest for at least 24 hours in the lairage.
2. Should be permitted to drink copious amount of water.
3. Should be starved for a period of 12 hours.
4. Should be quickly and carefully cast before slaughter.
5. Stunning prior to slaughter would be ideal.

(c) *The Butcher.*

1. Should be a licensed person. Experience and a theoretical knowledge of scientific flaying should be the basis for licensing.
2. Should be provided with the following essential articles which should always be clean, polished and sharp.
 - (a) A flaying knife (about 6" long with a slightly curved blade).
 - (b) A ripping knife (about 6" long with a straight pointed blade).
 - (c) A 'butcher's steel' (about 10" in length and made of steel) for sharpening.
 - (d) A small axe with a cylindrical head.
 - (e) A saw for sawing the bones.

General (1). In many countries organised efforts have been made (for many years past) with a view to improving the general standard of flaying. This can be carried out either by penalising bad work or encouraging good workmanship. All this could be done in India only if the butcher or flayer is employed by a Government or quasi-government organisation on decent wages. But first and foremost, legislation should be taken up for the licensing of butchers and the supply of instruments should be subsidised.

2. For the improvement of flaying, the Madras Government sanctioned a Flaying School. This school commenced functioning in March, 1953. The school imparts training to butchers and amateurs for a period of 3 months and includes practical as well as theoretical training

in flaying. About 60 students are trained annually. The school has auxiliary centres in the mofussil where Veterinary Assistant Surgeons are in charge. The theoretical training is held at the Madras Veterinary College and in the Veterinary Hospital. The practical training is conducted in slaughter houses. After the period of training the candidates undergo an examination in theory and practice, and the successful candidates are awarded certificates. So far 332 amateurs and butchers have been trained and issued certificates.

3. When once licensing of the butchers is legislated, flaying competitions could be conducted by the trade preferably in each slaughter house and good work could be encouraged by offering rewards to those who produce creditable results. This method has been adopted in the United Kingdom with good results.

4. *Mechanical Flaying*:—It is reported that several machines are now in the market. The general form of these machines is more or less the same. The machines are usually electrically operated and consist of a flaying tool which is held in the hand and connected by means of a flexible lead to a dynamo or other source of power. The cutting surface consists either of revolving blades guarded on the safety razor principle or two circular plates with blunt edged teeth which oscillate in opposite directions. These machines are reported to have proved efficient in practical use in different countries. These could be installed in major slaughter houses also in India. The use of the machines has so far been confined to hides in those countries.

5. In Libya, improper flaying of a hide has become the subject of law whereby a flayer responsible for bad flaying can be punished with deterrent punishment.

6. *Grading of Hides*: Now that there are trained flayers in the Madras State it is high time that grading of hides is taken up. At the time of meat inspection, the officer-in-charge of the slaughter house should examine the hide as well, both the flesh side and the grain side, and record the defects found on them. The forms should be numbered and the number on the form should be stamped on the hide. The hide should also indicate the origin of the take off i.e. from which slaughter house it was obtained. The tanner or hide purchaser should be permitted to go through these records, before purchase of hides.

7. Soon after introducing grading, classification of flayers should be taken up. Flayers removing hides without any damage are classified as first class flayers. Flayers who cause some damage to the less valuable portions of the hide, as second class. Flayers causing damage to the valuable portions of the hide as third class. Licensing should then be done according to the classification and the first class flayer designated as "Master Flayer". Where sufficient numbers of "master

flayers" are not available then the "master flayer," should perform the ripping operation and the flaying of the back. The second class flayer, the belly portion and the third class flayer allowed to flay the head, neck and legs. These flayers should be paid according to their classification and records kept of their work. Carelessness creeping in should be punished and good work encouraged by promotion, increments or bonus.

II. Fallen Hides and Skins

One should not lose count of the fact that the above improvements are only for slaughtered hides or "Butcher Hides" and they form only 15% of the total production of hides in India. The rest 85%, the majority, are made up of fallen hides.

"Fallen" hides and skins are derived from animals which have died either from disease or starvation or natural causes or which have been slaughtered *in extremis*. As these form a large majority, more attention should be paid to this limb of the hides and skins industry.

(a) These hides and skins are taken off the carcass usually by the chamars, who are novices, and totally ignorant of the technique itself. These people should be demonstrated and taught the technique. A scheme has been put up and is under consideration to train these people. For this the trained flayers should be recruited and each flayer should remain in a village for 10 days teaching the art of flaying and demonstrating the same to the chamars. This will of course take a long time, but it is better to make a beginning.

(b) It would be a good idea to start a cooperative hide and skin flaying centre in a group of villages. This centre should serve the villages within a radius of six miles and should possess the flaying instruments, hoisting apparatus, and facilities for carting dead animals to it. Curing may also be taken up in these centres.

Elsewhere in India especially in Uttar Pradesh there are flaying parties visiting villages, doing propaganda and giving lantern lectures and even demonstrating but since most of the chamars are ignorant and illiterate it is better to rely more on practical demonstrations.

Conclusion: The quality and value of good leather are to a great extent influenced by the quality of the hide. The defects caused in the initial stage (i.e. flaying and subsequent handling of a hide) cannot be improved by the best methods of tanning. Therefore it is highly necessary to pay as much attention to flaying as has been paid to tanning as a better flayed hide will not only fetch a better price but will raise the economic condition of the primary producer and from a better flayed hide a finer quality of leather can be produced. Good buildings should always have a strong foundation.

ETIOLOGY OF CLINICAL FORMS OF GOAT MASTITIS IN WEST BENGAL

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and

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Introduction

In India, majority of goats are not good milk yielders. They are small, compact and are generally free from mastitis. These goats are mainly reared for meat purpose. After kidding, the little milk that is secreted by the small udder is exhausted by frequent suckling. In this process, one of the important contributory factors for mastitis, *viz.* imperfect milking and the resulting accumulation of the milk in the udder, is thus ruled out for all practical purposes in the case of the large majority of Indian goats. There are, however, a few breeds among Indian goats which are reputed to be good milk yielders.

In West Bengal, particularly in big towns, good breeds are imported by dealers from Bihar and Uttar Pradesh for milk purpose. Many of these goats suffer from mastitis. Cross-breds between local and such imported goats are also susceptible to mastitis.

The object of this paper is to keep on record the types of bacteria generally associated with the clinical forms of goat mastitis found in West Bengal. Systematic investigation into this problem was not undertaken by any earlier worker in this province.

Literature

In India, while the incidence of goat mastitis among milk breeds is rather common, the attention it has received so far from Bacteriologists is comparatively insignificant as evidenced by the paucity of reports from Indian workers. In Western countries, goats are few and there are a large number of sheep. "Ovine mastitis" in those countries, unless specified, generally signifies mastitis among sheep, for which, of course, there is no paucity of literature. A study of various reports from those countries reveals the predominance of Staphylococcal mastitis over other types.

Materials and Methods

90 samples of milk from goats suffering from clinical forms of mastitis were examined during the year 1956. Majority of such samples were received from the Bengal Veterinary College hospital and the rest from various Veterinary hospitals outside Calcutta.

Indirect tests were not done. Direct tests, viz. microscopical and cultural, were applied to all these samples. Blood agar plates were used as routine media and necessary tests (except serological and pathogenecity tests) for typing out the bacteria were done in all cases.

Results

Staphylococcus was the commonest organism isolated from the majority of samples from both acute and chronic mastitis cases. It was interesting to note that *Staphylococci* were present in pure culture in the large majority of such samples. Coagulase positive *Staph. aureus* was encountered in all acute gangrenous mastitis cases and also in a few of the chronic botryomycotic forms, while *Staph. albus* was found mainly in the latter form of the disease. The relative incidence of these two types (*Staph. aureus* and *Staph. albus*) was found to be 3 to 1.

Majority of the strains of the *albus* type were Coagulase negative, although a few showed delayed and feeble reaction to such test. Fig. 1. shows a goat suffering from chronic Staphylococcal mastitis in which the udder had been greatly hypertrophied and indurated. It was amputated to give relief to the goat. Materials for microscopical and cultural examinations were collected from the dissected udder. *Staph. aureus*, which showed deep pigmentation and found to be haemolytic and coagulase positive (within 3 hours), was present in pure culture in this udder. Among the Streptococci, *St. agalactiae* was the only type found.

The results of examination of all the milk samples are tabulated below.

Table showing types of organisms and their percentages in milk samples examined.

Organisms detected and their percentages.							
Staph	Coli	Strept	Prot	Welchii	Pyocyan	Coryn	Sterile
%	%	%	%	%	%	%	%
61.1	13.3	7.7	5.5	2.2	2.2	2.2	5.5

Discussion

The present work was confined to the hospital cases and therefore, a correct assessment of the incidence of the disease in relation to the goat population in the neighbourhood could not be made. Reports collected from various sources, however, revealed that mastitis among goats, both imported and local cross-breds, is rather common. Many goats are thus rendered useless for milk purpose and some of them die from acute

gangrenous mastitis. Moreover, dangers of infection from the infected goats to the healthy ones are very real. In view of the sheep and goat development projects in this country, ways and means have to be found to combat this disease as effectively as possible, particularly in respect of the most prevalent type, viz. Staphylococcal mastitis. It has already been proved that Staphylococcus toxoid is a valuable agent both for therapeutic and preventive purposes. Systematic immunization of the flocks with this dependable agent will ultimately check the spread of the most common type of mastitis.

Summary

(1) 90 samples of milk from clinical forms of goat mastitis cases were examined. Staphylococcal mastitis was found to be the commonest.

(2) Immunization of the flocks with Staphylococcus toxoid has been suggested for checking the spread of this disease.

Acknowledgment

Gratitude is expressed for the help and encouragement received from Dr. S. Datta, Director.

The authors are also grateful to the Veterinary Officers who supplied the goat milk samples and to Mr. B. R. Dasgupta for helping in the laboratory work.

NASAL SCHISTOSOMIASIS IN BUFFALOES

By

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and

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Buffaloes infected with Nasal Schistosomes, rarely exhibit any clinical symptoms and this has given rise to the common belief that they are resistant to the infection.

Rao and Mohiyudeen (1955) referred to the previous literature on the subject and recorded a case of Nasal Schistosomiasis in a buffalo in Mysore State and further stated that an investigation to assess the incidence of the infection in buffaloes is contemplated. Biswal (1956) stated that out of 15 specimens of nasal scrapings of buffaloes on a

Government Farm in Orissa, examined by him, 25 revealed eggs and miracidia of the Nasal Schistosome, indistinguishable from those of cattle. Biswal and Das (1956) stated that the clinical symptoms of sneezing, snoring and profuse nasal discharge, commonly seen in affected cattle, are generally absent in buffaloes.

A major portion of Hanagal Taluk of Dharwar District is enzootic for Nasal Granuloma and it was decided to examine all the buffaloes of one village to find out the incidence of infection in them. Gejjihalli was selected. This is a small village and has 286 cattle and 53 buffaloes. Out of the former, on 24-3-1957, 71 showed clinical symptoms of Nasal Granuloma. Of the buffalo population 41 were available for examination. None of them had any clinical symptoms of infection and appeared quite normal in health. On very close examination of their nasal cavities, six of them showed irregular areas of congestion, studded here and there with pin point eruptions.

Nasal discharges of all the 41 were examined microscopically and out of these, 21 were positive for eggs of *S. nasalis* (inclusive of all the six referred to above). The eggs were well developed and larger in size than what are usually found in affected cattle. The measurements of the eggs were within those recorded for *S. nasalis*. Actively moving miracidia were seen in the majority of the nasal discharges examined, which is not usually the case in those of cattle. Biswal and Das (1956) have also stated that "it is interesting to note, in contrast to cattle, in many of the buffaloes, nasal scrapings contain a larger number of miracidia."

Discussion

Whether the Nasal Schistosome found in cattle and buffaloes is exactly one and the same species is still an open question: in one, specific lesions are seen and in the other not. Abdus Salam and Sarwar (1953) stated that while mild or symptomless infestation in buffaloes, in areas where cattle are suffering from Nasal Granuloma has been recorded, it had never been seen in places where Nasal Granuloma does not occur and that they have "recently recorded the occurrence of *S. nasalis* in 48.9% of buffaloes in the Punjab, where Nasal Granuloma has never been seen in cattle. Of 85 cows and bullocks examined in the same area, none was found infested."

Certain explanations have so far been given for the absence of Nasal Granuloma in Buffaloes. Anant Narayana Rao (1936) explained it as being due to an immunological factor; that buffaloes owing to their habit of wallowing in water are consequently exposed to greater chances of infection with *S. spindalis* for which they are the normal hosts and this common infection gives them a group immunity against

Schistosomes and thus frustrates any subsequent infection by *S. nasalis*. This does not explain the fact that buffaloes despite absence of clinical symptoms, void fully developed eggs of *S. nasalis* indicating thereby, an unhindered development of the parasite. Abdus Salam and Sarwar (1953) have concluded that "it suggests that a factor other than infestation with *S. nasalis* is required for the causation of Nasal Granuloma".

It is to be borne in mind that relatively better developed eggs and active miracidia are seen in the nasal discharges of buffaloes, indicating thereby, a congenial environment for the development of the parasite. Nasal Granuloma is the result of a protective inflammatory tissue reaction on the part of the host, excited by the parasite or its products, and this is not seen in buffaloes. From these two observations, an obvious inference that may be drawn is that the parasite and host are able to get on together, without any serious detriment to either of them. In the light of this, a plausible explanation for the absence of Nasal granuloma in buffaloes, in spite of an infection with the nasal schistosome, may be that the parasite has attained a stage of "Complete compatibility" with the host, using the term as defined by Cameron (1951) in his text book.

Acknowledgment

Our grateful thanks are due to our Director, Dr. K. S. Shetty for his guidance and permission to publish this paper.

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STUDIES ON THE GESTATION LENGTH AND BREEDING AGE IN DONKEY MARES

By

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Gestation period in mares has been studied by various workers but a limited information regarding this is available for donkey mares. The study is of importance to a breeder as it helps him to prepare the prospective dam for foaling and also aids in settling cases of disputed parentage. Knowledge of the age at first service and first foaling assists the breeder in estimating the normal functioning of reproductive system.

Review of the literature:—Jennison (1927) reported the average gestation period of the ass as 367 days. Jordao (1951) observed that Brazilian asses took, on an average, 374.3 days to foal. Cortez (1950) reported that the individual parents, the sex of the foetus or the season of the year did not have any significant effect upon the length of the gestation period in race horses. Rollins and Howell (1951) showed that the genotype of the foetus affects the length of the gestation period in the Arabian horses. Ilancie and Zavrnik (1952) obtained variations between families and between months for the gestation period but not between the sex of the Arab foals.

Material and Method:—The data used in the study were taken from the records of 128 mares bred at the Government Livestock Farm, Hissar, during the period 1916-1954. Animals were checked regularly and those in heat were given natural service.

Results

Length of the gestation period:—It was observed (Table 1) that the largest percentage of males and females were born within 370-379 days after conception. The mean gestation periods for males and females were 374.86 ± 0.81 and 373.98 ± 0.73 days respectively with an overall average of 374.43 ± 0.25 days (Table 2).

TABLE I

Distribution of the length of gestation period in donkeys.

Gestation period (days).	No. of foals			Distribution of gestation period		
	Male	Female	Total	Male percent	Female percent	Total
330-339	3	—	3	0.92	—	0.47
340-349	5	10	15	1.52	3.21	2.34
350-359	24	21	45	7.29	6.73	7.02
360-369	99	87	186	30.09	27.88	29.02
370-379	101	105	206	30.70	33.65	32.14
380-389	58	56	114	17.63	18.27	17.94
390-399	26	22	48	7.90	7.05	7.49
400-409	7	9	16	2.13	2.89	2.50
410-419	2	—	2	0.61	—	0.31
420-429	1	1	2	0.30	0.32	0.31
430-439	1	—	1	0.30	—	0.15
440 and above.	2	—	2	0.61	—	0.31
Total	329	311	640			

TABLE II

Mean gestation periods for male and female foals.

Male		Female		Total	
No. of cases	Mean days	No. of cases	Mean days	No. of cases	Mean days
329	374.86 ± 0.81	311	373.98 ± 0.73	640	374.43 ± 0.25

TABLE III

Influence of month of foaling on gestation period.

Months	Male		Female		Total	
	No. of cases	Average gestation period	No. of cases	Average gestation period	No. of cases	Average gestation period.
January	20	374.0 ± 3.7	9	375.3 ± 4.9	29	375.9 ± 3.1
February	14	375.1 ± 5.9	31	381.6 ± 3.9	45	380.0 ± 3.6
March	28	382.5 ± 6.1	36	378.1 ± 4.8	64	380.0 ± 4.2
April	39	382.0 ± 3.4	28	375.9 ± 5.9	67	379.4 ± 2.9
May	46	375.9 ± 3.2	43	377.2 ± 3.8	89	376.6 ± 2.7
June	40	371.0 ± 4.7	33	366.9 ± 6.2	73	369.2 ± 3.8
July	24	370.4 ± 5.2	31	371.8 ± 6.0	55	371.2 ± 4.8
August	30	370.0 ± 3.4	21	366.7 ± 5.1	51	368.7 ± 3.0
September	22	366.9 ± 4.2	23	370.7 ± 6.3	45	368.8 ± 3.9
October	25	370.8 ± 7.1	12	367.8 ± 4.6	37	369.8 ± 4.1
November	14	370.4 ± 9.1	19	370.6 ± 6.7	33	370.5 ± 6.5
December	27	374.6 ± 5.4	25	374.6 ± 4.7	25	374.6 ± 4.2
Total	329		311		640	

2. *Effect of month of foaling*:—The mean gestation periods of foals born according to month of foaling (Table 3) worked out to be the longest for males during the month of March and for females in February. It was shortest for males in the month of September and for females in the month of August. The number of foalings was maximum in the month of May and minimum during the month of January. Analysis of variance (Table 4) showed that the variation between months was significant but the effect of the sex on months was not significant.

TABLE IV

Analysis of variance of gestation period for the month of foaling.

Source of variation	D. F.	Mean S.	F. Ratio
Between months	11	1118.8	1.82*
Between sex	1	26.5	
Between sex X months interaction	11	78.3	
Error	616	609.9	
Total	639		
Significant at 5% level			

TABLE V

Effect of sire on gestation period.

S. No.	Sires	Male		Female		Overall	
		No. of cases	Mean gestation period	No. of cases	Mean gestation period	No. of cases	Mean gestation period
1	Medow Sweet	19	376.3 + 3.4	17	371.6 + 2.8	36	373.1 + 2.3
2	Hitozman	3	369.6 + 4.7	4	366.7 + 4.2	7	368.0 + 3.9
3	Homer	15	374.1 + 1.9	6	369.0 + 1.4	21	372.7 + 1.2
4	Hector	3	370.3 + 3.8	6	370.5 + 3.1	9	370.4 + 2.8
5	Memmons	31	377.4 + 1.2	24	373.7 + 3.9	55	375.9 + 3.5
6	Maharana	28	378.4 + 2.7	27	380.7 + 2.8	55	379.6 + 2.4
7	Horis	19	378.0 + 3.9	16	371.2 + 3.1	35	374.7 + 2.7
8	Muri	31	368.8 + 2.2	11	373.7 + 1.9	42	371.5 + 1.6
9	Monkton	4	361.7 + 3.3	11	361.7 + 3.9	15	363.4 + 3.0
10	Dacota	48	378.0 + 1.5	31	371.7 + 3.8	79	375.1 + 3.6
11	Horatio	10	379.7 + 6.4	6	370.8 + 5.7	16	376.4 + 5.9
12	Malta	21	370.3 + 1.3	9	372.0 + 6.9	30	371.3 + 3.3
13	Hopur	3	377.6 + 3.4	8	382.1 + 5.2	11	378.2 + 4.9
14	715	21	372.9 + 1.1	28	372.1 + 3.7	49	372.6 + 3.4
15	Mesmate	31	371.9 + 1.1	10	375.5 + 2.9	41	373.9 + 2.2
Total		293		299		592	

3. *Effect of the sire of the foal*:—The mean gestation period for foals as influenced by different sires (Table 5) varied from 363.4 ± 3.0 to 379.6 ± 2.4 days and the mean squares for sires were significant (Table 6). The effect of sex on sire was not significant. 33 sires were not taken into account for the analysis as the number of cases was very small to give any reliable estimate.

TABLE VI

Analysis of variance of gestation period for sires.

Source of variance	D. F.	Mean S.	F. Ratio
Between sires	...	...	...
Between sexes	14	310.8	1.94
Between sex X sire interaction	1	128.1	
Error	14	39.6	
Total	532	163.9	
Significant at 5% level	...	561	

4. *Age at first service*:—The average age of the donkey mares at first service was found to be 42.46 ± 0.85 months.

5. *Age at first foaling*:—The donkey mare foaled for the first time at the average age of 59.67 ± 1.09 months.

Discussion

The results of these investigations revealed that the donkey mares carried their foals for a mean period of 374.43 ± 0.25 days which is almost the same as observed by Jordao *et al* (1951) in Brazilian asses with 374.3 days of gestation period but it differed from the findings of Jennison who has worked it out to 367 days. The sex of the foal was responsible for variation in the length of the gestation period and difference of about 1 day between the gestation periods for males and females was not found to be significant. This is in agreement with the observations made by Ilancie *et al* (1952) and Cortez (1950) but it is contrary to the results presented by Rollins *et al* (1951). The month of foaling and the sire were found to have influence on the length of pregnancy and the results confirm the findings of Ilancie *et al* (1952).

Summary

The average length of 640 gestation periods of donkey mares was 374.43 ± 0.25 days. The gestation period was slightly longer (374.86 ± 0.81) for males than for females (373.98 ± 0.73) for males than for females. For male foals, the longest average gestation period was recorded in March and for female foals in February. The shortest average gestation period for male was in September and for female in June.

The month of foaling and the sire had a significant effect on the gestation period.

The average age for first service was 42.46 ± 0.85 months and the average age for first foaling was 59.67 ± 1.09 months.

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THE ROLE OF HEREDITY ON THE RESISTANCE TO INFECTIOUS DISEASES

By

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The inheritance of diseases has been recorded by several workers. Report of the inheritance of achondroplasia (Wriedt, 1925); muscle contracture (Mohr, 1930); Cataract (Gregory *et al.*, 1943); epilepsy (Atkeson *et al.*, 1944.) in cattle have been published. However as early as 1906, the geneticist had shown that the resistance to some of the diseases is inherited.

Resistance to certain diseases in respect of species, breed, family or the individual has been observed and it is said they are naturally immune. Genetic resistance when made homozygous for the strain becomes a permanent attribute. Probably the host genotype furnishes the nutrients on which pathogen may not work readily or not at all. Plant breeders have made much progress in developing strains resistant to many plant diseases.

The production and occurrence of the diseases can be attributed to any or a combination of factors such as environmental resistance, susceptibility of the host and the condition of the organism. At any rate, it is the variation in the genotype which is important for selection against disease infection. Genotypic variations in host susceptibility

contribute to variations during the course of epidemic. Acquired passive and active immunity plays some part but power of becoming immunised is closely related to the individual's natural resistance. It is also, a function of genotype.

Selective breeding experiments carried out by several workers against infectious diseases indicate that some of them are inherited. In Desi birds as reported from the Indian Veterinary Research Institute, the resistance to Ranikhet disease was greatly increased in successive generations by breeding the individual selected on the basis of their survival of the offspring after the administration of the pathogen. Similar results have been obtained for fowl typhoid in chickens (Robert and Card, 1926.); for mouse typhoid (Webster, 1924 and 1925; Schott, 1932; Hetzer, 1937.); for Danisz bacillus infection in rats (Irwin, 1927.) and for abortus infection in rabbits (Cole, 1930.) In cattle the resistance to some diseases is known by studies on mastitis (Murphy *et al.*, 1944.); on tuberculosis (Rupert, 1935. cited by Gilmore, 1952.) and on paratuberculosis (Mathew, 1947.)

Recent researches have shown that most of the pathogens lose their virulence which is probably due to the formation of a biochemical substance derived from gene mutation. This has been proved experimentally and also that there is no interaction between the host and the organism. How far genetics can play its role in bringing about such changes is still not clear.

Nutrition, climate, age and sex are also known environmental factors responsible for resistance to infectious diseases.

The application of genetical methods as tools for future researches is indeed not too small. Biochemical genetics offers means by which the problems of disease could be reduced. Mutagenesis allows of control variations of reacting systems and may facilitate studies of such systems. Advances along these lines have already been made by causing genes of bacteria and viruses to mutate and then studying in the light of the diseases they normally produce.

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(1921)

A SUPERNUMERARY THORACIC VERTEBRA AND TWO FLOATING RIBS IN A BUFFALO-CALF

By

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In the course of routine dissection of a two year old buffalo (bull-calf) calf in July, 1956 for the demonstration class, the presence of a supernumerary Thoracic vertebra and two floating ribs was noticed.

There were two floating ribs, one on each side of the thorax articulating with the fourteenth (supernumerary) Thoracic vertebra.

FLOATING RIBS

Left Floating Rib.—Measured 12" in length. Ossification of the shaft had extended proximally from the angle upto the vertebral end.

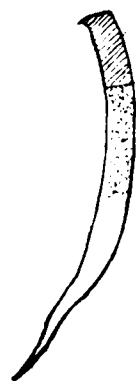


Fig. 1

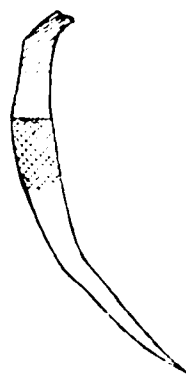


Fig. 2

Left floating rib
(lateral view)
scale 1" = 3"

Right floating rib
(lateral view)

- - ossified part
- ▨ - Fibrous part
- ▩ - Partly ossified part
- - Cartilage

This ossified portion measured 2". Below this for 3", this rib was fibrous and then the rest of it was cartilaginous. (Figure 1) The Serratus

Posticus was attached to the lateral surface of the rib while the Retractor costae was attached to the posterior border. It is evident that proximal to the angle there had been chondrification and subsequent ossification. Below the angle for 3" there had been no chondrification and this portion remained fibrous. Below this fibrous portion, there had been no ossification after the initial chondrification.

Right floating rib.—Measured 12" in length. Ossification in this was complete in the proximal part. This ossified part measured 3". Below this, there was partial ossification for 2". The rest of the rib was cartilaginous. (Figure 2).

Both the ribs showed normal Costo-central and Costo-transverse articulations. The Inter-costal muscles were normal between the 13th and the 14th ribs on both sides.

Supernumerary Vertebra.—By its position and characters, this vertebra is called the 14th Thoracic vertebra. The floating ribs described above were articulating with this vertebra.

CHONDRIFICATION AND OSSIFICATION OF RIBS

Normally the Costal process has a single centre of chondrification. A centre of ossification appears near the angle of the rib. The distal ends of the ribs always remain cartilaginous as costal cartilages.

Now from the account given above about the floating ribs it is clear that the left floating rib shows evidence of the presence of two centres of chondrification—one proximally and another distally, with an intervening part that has remained membranous. Probably the process of ossification from its centre could not extend distally due to failure of chondrification of this intervening strip of fibrous tissue.

It is to be concluded that the right floating rib, however had only one centre of chondrification as is seen by the progress of ossification of this rib proximally and distally from the centre of ossification and also by the unossified portion remaining cartilaginous.

Summary

Two centres of chondrification in a floating rib of a two year old buffalo-calf have been recorded.

Acknowledgment

I am grateful to Dr. D. Mariappa, Professor of Anatomy, Madras Veterinary College for useful guidance and help in the preparation of his article.

REFERENCE

Developmental Anatomy by Arey.

Clinical Article

A SECOND CASE OF URETHRAL CALCULUS WITH RUPTURE OF BLADDER IN A BULLOCK, SUCCESSFULLY OPERATED UPON

By

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I recorded in January '57 issue (Vol. XXXIV, No. 1) of the *I.V.J.* a case of the above description. I happened to come across another case of similar condition in a bullock and I made bold to operate on the animal with successful result again. I wish to place on record this case also for whatever it is worth.

A bullock aged 9 years and belonging to Sri Yendluri Chelliah of Machavaram, a place four miles away from my dispensary was reported on 4-4-56 to have not passed urine from 31-3-56. The owner said that the animal which was kicking about the abdomen and highly restless till the previous night, had suddenly become quiet since that morning (4-4-56) and was not showing those distressing symptoms.

I gave out my provisional diagnosis, subject to my personal examination, as Urethral Calculus with rupture of bladder. I explained to him the seriousness of the condition and remote chance of any recovery. He wanted time for 4 more days to complete his indigenous line of treatment, before he decided to submit the animal for operation. I gladly agreed to the proposal, expecting the animal to be dead by then.

To my surprise he turned up on the appointed day and requested me to go over to his village and operate. On arrival I found the animal in a comatose condition. Palpation, and rectal examination combined with other clinical symptoms, made me to confirm my earlier diagnosis. I told the owner that there was hardly any chance of its recovery. He insisted upon my operating on the animal irrespective of the result.

I secured the animal suitably as has been explained in my previous article, the calculus was located, operated upon and removed. Sulphanilamide powder was dusted and the wound was allowed to heal as an open one. Twenty lakhs of Procaine Penicillin was injected intramuscularly. This treatment was continued daily for the following ten days with the help of Sri R. D. Nageswara Rao, Veterinary and Livestock Inspector stationed in that village itself. I visited the village

on the 4th and the 11th day. From the 3rd day onwards the bullock was standing and picking up some food. The flow of urine slowly began to take the normal route. When I saw the animal on the 11th day there was complete cessation of urine through the operated wound and free flow of urine was noticed through the natural route. The animal made an uneventful recovery.

News and Views

Great Loss to Racing:—With the demise of His late Highness the Aga Khan, the world has lost "the most fabulous figure the Turf has ever known". It is a great loss to Racing and Scientific Horse-breeding. His successes on the British Turf are never likely to be excelled for he won "the Derby five times, the St. Leger six times and the Two Thousand twice, besides two Oaks and One-Thousand Guineas once, 16 classics in all. His winnings have been estimated to have been close on £1 million". Let us hope the members of his family will try to maintain the high interest in Horse-breeding which His late Highness has so assiduously built. The Aga Khan is dead; Long live the Aga Khan!

General K. M. Cariappa, Ex-Commander-in-chief in India, gave expression to the following, while addressing the students of Madras Institute of Technology recently. "We have started sending delegations to countries like China and to try to copy the methods followed in those countries. One could certainly admire communism and capitalism in Russia and America respectively, but those ideologies by themselves do nothing for the progress of this country. We possess ability to solve our problems in our own way. Look at Japan and Germany, the two nations which had almost been completely wiped out by the war, but had in their own way, by dint of hard work, re-constructed themselves so admirably in so short a time. We can with real profit, take cues from them". This is exactly what we have been advocating in our own humble sphere of work. National plans must be based on the culture, conditions and genius of the people. Anything and everything, exotic in nature, need not necessarily be good to our country. Let us be wary!

Madras has stolen a march over Mysore! The Serum Institute at Ranipet known as the Institute of Veterinary Preventive Medicine, is celebrating its Silver Jubilee on the 5th and 6th October 1957. An official announcement to that effect is appearing elsewhere. The Silver Jubilee of the Mysore Serum Institute is in fact long over due. We know arrangements are also in progress there to celebrate the occasion.

Veterinary College for Mysore:—Bangalore, July 10, 1957. A Veterinary College for the Mysore State is to be established at Hebbal, near Bangalore City. Every effort is being made by the Government to open the College during the current academic year. The non-recurring cost of the new College will be Rs. 30 lakhs and 75 per cent of this sum is expected to be made available to the State Government by the Centre, as grant. While the State Government had taken a decision sometime ago to establish a Veterinary College in the State, the location of the College was not decided and the choice lay between Hebbal where there is an Agricultural College and Hesserghatta, about 20 miles from Bangalore, where there is a composite livestock farm. The Mysore Cabinet which met this morning took a decision to locate the College at Hebbal.—*F.O.C.*

That is happy news indeed. But we have not heard of any further advance in the matter. We know the wheels of the Government move slowly. Let us have patience.

Aid for Milk Schemes—New Delhi, August 29, 1957. Assistance to the extent of Rs. 36.5 lakhs has been accepted for milk supply schemes from Australia, Canada, Netherlands, New Zealand and the United States, the Minister for Food and Agriculture, Mr. A. P. Jain, said in the Lok Sabha to-day.

In a written reply, Mr. Jain informed Mr. Bahadur Singh that this assistance would be utilised for implementing the Greater Calcutta milk scheme and the Madras milk scheme.

Hindu, 1-9-57.

Milk Powder Factory.—New Delhi, August 29, 1957. Three creameries and one milk powder factory are proposed to be set up in the country during the current financial year, the Minister for Food and Agriculture, Mr. A. P. Jain, told Mr. Jhulan Sinha in the Lok Sabha to-day.

In a written reply, Mr. Jain said that the creameries would be located at Khagaria, (Bihar), Girnar area (Bombay) and Manpat (Madhya Pradesh), while the milk powder factory would be located at Amritsar (Punjab). The equipment to be imported for these plants would be supplied by the American Technical Co-operation Mission and arrangements for their procurement through the India Supply Mission in Washington were under way.

Hindu, 1-9-57.

Indian Science Congress.—Coimbatore, August 29, 1957. The 45th Indian Science Congress will be held at Madras in the first week of January 1958 at the University Buildings. Dr. A. Lakshmanaswami Mudaliar, Vice-Chancellor of the University, has been elected Chairman of the Reception Committee.—*F.O.C.*

Hindu, 1-9-57.

A Golden Jubilee.—It may not be an exaggeration to state that Coimbatore in the State of Madras, has been made famous by its Agricultural College, along with several other factors. It is an institution of which any country could be proud with regard to the quality of work turned out and the facilities provided both for Research and Education. Its contribution towards development of Sugarcane, Cotton and Cereals ranks with the best in the World and is recognised as such. It is this institution that has been celebrating its Golden Jubilee on the 3rd September 1957. We most heartily join in the chorus of praise showered on that institution and wish the institution greater fame in the service of humanity!

B. V. M. A. Bulletin.—We wish to announce that the Bombay Veterinary Medical Association has come out with its long expected "Bulletin". It was released on 15th August 1957. We welcome it into the field of Veterinary Journalism and wish it a long and useful career!

It is a quarterly and the Annual Subscription is Rs. 5'-. Apply to:— The Editor, B. V. M. A., Bulletin, 5, Anil, Shivaji Park Road, No. 5, Bombay-16.

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.]

ANTIBIOTICS AND THEIR VARIED USES

BY

M. S. JAYARAMAN, G.M.V.C., B.V.SC.,

Department of Anti-Toxins, King Institute, Guindy.

In the previous two articles we saw the usefulness of vaccines and sera in the prevention of infectious diseases. In the present one I will briefly narrate the role of what is known as antibiotic therapy to combat infectious diseases. Antibiotic therapy, an innovation of the current century, has created a unique epoch in the history of medicine. It is by and large a curative one. The potentialities of the antibiotics in various fields of animal husbandry which have been unfolded will also be referred to in brief.

The word 'antibiosis' means destruction of life or living matter. It had been observed as early as the days of Pasteur that antagonism existed between certain bacteria. Later similar observations were made

between bacteria and molds. But expectations of exploiting this existing antagonism as a therapeutic application languished for want of knowledge in many of its facets.

The chance discovery of Penicillin by Alexander Fleming in 1929, when he found certain bacterial cultures in his Laboratory were being inhibited in their growth and gradually destroyed due to a contaminating mold and his further researches establishing its usefulness in local treatment of wounds opened up a vista of pioneering work. But it took more than a decade for the consummation of its large scale production for clinical application. Close on the heels of the discovery of Penicillin, vigorous and continuous search by Scientists led to the discovery of more antibiotics.

It is not all antibiotics that we know of have been found to be therapeutically useful, for some of them are too toxic to be administered. The following are the common antibiotics that find clinical application : 1. Penicillin, 2. Streptomycin, 3. Aureomycin, 4. Terramycin, 5. Chloromycetin, 6. Bacitracin, 7. Tyrothricin. The last two are from bacteria, the rest being from various molds.

Production of Antibiotics

Only those particular strains of molds or bacteria capable of producing the antibiotic agent in sufficient quantities are selected and cultivated in artificial nutrient media under strictly controlled conditions. The growth of the mold or bacteria is accompanied by the production of the antibiotic agent in the medium. This is extracted, purified and finally dispensed in a powdery form, the whole process being a highly complicated one. Synthetic production of antibiotics has been found to be uneconomical in many cases.

Potentialities and limitations of antibiotics

Antibiotics are highly useful in combating bacterial infections only. Except in a very few cases they are of no avail against viruses though they can be used to check bacterial complications that often follow initial viral infection. Antibiotics are selective in their activity against bacteria. Different antibiotics show different ranges of activity. One of the broadest classification of bacteria is as per one of their staining characters which is either gram-positive or gram-negative. Penicillin is active against most of the gram-positive organisms while Streptomycin is effective against gram-negative ones. Antibiotics like Aureomycin and Terramycin having wider range of activity against both gram-positive and gram-negative organisms are termed broad-spectrum antibiotics.

The mode of action of the antibiotics is not known or is only partially known. The general consensus of opinion is that they act by

interfering with the metabolic activity of the bacteria. Depending upon their concentration, antibiotics may either be destructive to the bacteria or arrest the growth of them. But in the way they find therapeutic application they are mostly bacteriostatic *i.e.* inhibit the growth of the bacteria. For antibiotics to exert their maximum effect, dosage should be so regulated as to obtain optimum blood levels. This depends upon the nature and severity of infection and the age and body weight of the patient. It is well to note that an over dose may not produce the desired level. Similarly an insufficient concentration leads to the acquisition of fastness or resistance by the bacteria. This acquired resistance may be passed on as a stable hereditary character to future generations. This is how a resistant strain emerges. Development of resistant strain accounts for treatment failures in some cases. Rapid development of extreme resistance has been observed in the course of treatment with Streptomycin. To prevent development of resistant strains, the Government have in some countries prohibited the indiscriminate and widespread use of antibiotics. Their use is restricted to absolutely necessary conditions. To make antibiotic therapy efficacious it is usual in well advanced countries to study the susceptibility of the offending organisms to the antibiotic in well-equipped Laboratories immediately before instituting such treatment or during the course of treatment.

Sometimes antibiotics are of no avail against some bacteria. It may either be due to their natural resistance or to production by them of metabolites of enzymatic nature which render antibiotics ineffective. Penicillin for example is rendered non-viable by some organisms which produce the enzyme Penicillinase.

Antibiotics are not inactivated in the presence of blood, body fluids or necrotic tissue, an advantage over chemotherapeutic agents like sulpha drugs.

In clinical application to achieve the best possible results one antibiotic is sometimes combined with another. But it does not mean that any combination will work well. Combination of Penicillin and Chloromycetin has been observed to yield unfavourable results. A cautious study is therefore necessary. Sometimes therapeutic substances like Sera and Sulpha drugs are administered along with the antibiotic so as to be complimentary to it. This method of treatment is called Adjuvant therapy.

From the extensive and intensive use of the antibiotics it may seemingly appear they are bereft of any harmful effect on the system which is not in accordance with facts. There are recorded cases of untoward results especially in human beings. In the hands of quacks and the inexperienced they may do more harm than good.

Antibiotics in Animal Nutrition

Medication of the feed of the young livestock with antibiotics has been found to be of benefit by preventing diseases, promoting health and thus laying the foundation for better productive capacity.

Antibiotics in Artificial Insemination

Antibiotics have been found to be useful in enhancing the keeping qualities of semen by warding off bacterial contamination.

Antibiotics in Preservation of meat

Antibiotics are also being used in countries like America to prevent spoilage of meat, poultry and fish. In the case of meat, small quantities of broad-spectrum antibiotics are injected into the animals before slaughter. Surface application of antibiotics over the meat has also been found to prevent spoilage and discoloration. The preservation of poultry is accomplished by adding antibiotics to the water in the chill tanks used for freezing and preserving. These new developments may well revolutionise practical methods in the marketing of meat, fish etc.

REARING OF BUFFALO CALVES

By

K. S. SHANMUGASUNDARAM, G.M.V.C., B.V.Sc., P.G. (A.H.)

Buffaloes have great possibilities in the Milk Supply Schemes of any State. In India Murrah, otherwise known as Delhi Breed of buffaloes are good yielders of milk, rich in butter-fat. Western countries like Denmark which specialise in dairying are struck with wonder in the matter of butter-fat yield of our buffaloes. The buffaloes in Madras State are poor yielders as compared to the Delhi Breed. Experience in the Government Farms show that the Murrah buffaloes are capable of good performance in Madras State as well, provided they are attended to properly. However, it is not possible either for the Government or any other agency to get a large number of Murrah buffaloes from North India. The demand for these buffaloes from other States as well is very high. The only way of improving the buffaloes in Madras State is by what is called "grading-up" the local buffaloes with Murrah Breed. That is, the Murrah buffalo bulls should be used for siring the local buffaloes, and the calves born should again be sired by pure Murrah bulls and by repeating this process for about five or six generations the local breed becomes as good as the pure Murrah buffaloes and at the same time get acclimatised to local conditions. With this end in view the Government have been intro-

ducing Murrah buffalo bulls for stud purposes for many years past and now a large number of these bulls are at stud both for natural service and for Artificial Insemination. The success of these efforts depends on the proper rearing of the calves born since the results will be seen only in the performance of the calves. Comparatively speaking buffalo calves are more delicate than the cow-calves due to certain inherent handicaps. The following few points are suggested from the experience in State Farms as guidance for proper rearing of buffalo calves.

1. *Before Birth.*—A dry she-buffalo in calf should not be neglected on the ground it is not giving milk. This is a short-sighted economy. In the first place the buffalo pays back in the form of rich manure in proportion to its feeding. Secondly she sustains the calf well through adequate nutrition. Thirdly she recoups her health and re-conditions herself, thereby making herself quite fit for subsequent milk-production. Adequate feeding of she-buffaloes at least 2 months prior to calving is essential and is a worthy investment which will give very good dividend in the form of good calf and increased milk yield after calving. The feed should have enough greens, in the absence of which at least one to two ounces of Shark Liver oil should be added to the feed.

2. *Immediately after calving.*—The navel of the calf should be attended to immediately after birth since this is the gateway for all future troubles. The navel cord should be dipped in weak solution of Tincture Iodine (1 part with 5 parts of water) and stripped off completely. Then the base of the navel should be painted with Tincture Iodine and dusted with Sulphanilamide powder. This treatment of painting Iodine and dusting powder should be done at least twice a day daily till the cord shrinks and drops down which will take place in about 7 to 10 days.

3. *Feeding.*—From the time of calving till the close of the 3rd day the calf can be allowed to remain with the mother so that it might suckle at frequent intervals. Both morning and evening the buffalo should be milked to remove the surplus milk and to get her used to milking. By adopting this procedure, the calf will get adequate quantity of colostrum, the first milk which is very essential for the well-being of the calf. Secondly the health of the buffalo also will be good as this practice prevents an usual complication called "Milk Fever". Thirdly this gives better milk stimulation and the buffalo will give more milk. From the fourth day the calf should be allowed to suckle at least one teat completely in the morning and evening. It will be a good policy to allow one fore-teat in the morning and one hind teat in the evening. The right and left sides should be alternated on successive days. Before allowing the calf to suckle, the udder should

be wiped with a clean cloth dipped in warm water, and the milk should be drawn from the teats at least in 3 strips so that the fore milk which is harmful to the calf may be eliminated and at the same time it may be ensured that the flow of milk is all right. After 15 days the calf can be fed with "Kanji Water" in the noon. The calf should be encouraged to drink this from the pail. It is not advisable to drench it. "Agathi" leaves and green grass are to be provided when the calf begins to nibble grass, and these should always be available before the calf.

4. *Housing*.—Keep the calf tied separately on dry floor with protection from sun and rain but with adequate ventilation. Provide bedding and remove dung then and there. If the dung is clay-coloured it indicates illness and white colour is a danger signal. The calf should be kept tied closely so that it may not lick odd objects. To place a lump of rock-salt or a "Mineral Brick" before the calf is a good policy so that the calf will lick an useful object.

5. *Supplemental feeding*.—Buffalo's milk is deficient in vitamins, and the minerals available are inadequate. Hence giving about $\frac{1}{2}$ to 1 ounce of commercial Mineral Supplement, preferably churn No. 105, mixed with 10 to 20 drops of Shark Liver oil is a good practice. Both can be mixed together, with a little of jaggery and rubbed on the tongue every morning.

6. *Worm Treatment*.—The enemy number one for buffalo calves is the long round worm called "Ascaris". It is impossible to prevent the infection of this worm as it gains access to the calf even in the mother's womb. On the 8th day after birth the calf should be given two ounces of neem oil with 3 drops of formalin as a drench. This should be repeated once in 4 days. After the first month the oil may be increased to 3 ounces and formalin to 5 drops and after the 2nd month to 4 ounces and 10 drops. After 3 months it is enough to give this oil once a week till the calf completes 6 months of age. This is very important since when the worm burden becomes very heavy, particularly in very young calves, it is impossible to save the calf. The worms deplete the nutrients, help in the multiplication of harmful bacteria, resulting in all sorts of complications.

7. *General*.—A calf which suckles actively and which passes dung quite normal in colour and consistency can be taken to be in sound health. Appearance of small discrete patches on the withers, inside of ears and muzzle indicate that the worm burden is increasing warranting special remedial measures. It is not advisable to take any risk of even suspected illness during the first 3 months of the life of the calf and immediate expert advice should be sought for. All troubles taken during the early life of a calf will pay adequate dividends in the long run.

I. C. A. R.

Farm News Release

Leaf-Eating Caterpillar—Pest of Lucerne.—Dusting the lucerne field with B. H. C. powder easily controls the lucerne leaf-eating caterpillar.

The pest feeds on the leaves of the plants generally during mornings and evenings, and sometimes causes serious damage to the crop.

The caterpillar is also found feeding on other crops such as onion, garlic, pulses, safflower, linseed, cruciferous vegetables, tomato, brinjal and cotton.

To control the pest on lucerne, five per cent B. H. C. should be dusted on the field at 15 to 20 pounds per acre, after the cutting of the crop.—282/57.

An Announcement

SILVER JUBILEE OF THE INSTITUTE OF VETERINARY PREVENTIVE MEDICINE, RANIPET, MADRAS

The Institute of Veterinary Preventive Medicine, Ranipet is completing 25 years of its useful existence and service to the Nation and to mark this occasion, it is proposed to celebrate the Silver Jubilee in a fitting manner on the 5th and 6th October, 1957. All the members of the profession are cordially invited to attend the function and make it a grand success.

S. VANCHESWARA IYER,
Superintendent,
Institute of Veterinary Preventive Medicine,
Ranipet.

THE MADRAS STATE VETERINARY CONFERENCE

At an urgent meeting of the Managing Committee of the Madras Veterinary Association on 4—9—'57, it was resolved to hold the 12th Madras State Veterinary Conference at Ranipet, in conjunction with the Silver Jubilee Celebrations of the Institute of Veterinary Preventive Medicine.

The Director of Animal Husbandry, Madras was unanimously elected as the President of the Conference and he is being approached to accede to our request. Mr. S. Vancheswara Iyer, Superintendent, I. V. P. M. Ranipet, was elected as Chairman of the Reception Committee. Other details will follow in the Circular notice to be issued. Members of the profession are alerted to be in readiness to attend the Conference in large numbers and make it a success.

Madras. }
5-9-'57.

T. VINAYAKA MUDALIAR,
President,
Madras Veterinary Association.

Association News

THE MADRAS VETERINARY ASSOCIATION

Proceedings of the meeting of the Managing Committee
held in the Library Hall of the Madras Veterinary College on
Monday, the 29th July 1957 at 4.45 p.m.

Members Present:—

Sri T. Vinayaka Mudaliar (in the Chair).

„ Bertie A. D'Souza,	Sri C. I. John,
„ I. D. Mantramurti,	„ V. Satchidanandam,
„ M. C. Chellam,	„ T. A. Natarajan,
„ G. Osman Khan,	„ M. Ranganathan, (Treasurer),
„ F. D. Wilson,	„ J. C. Victor, (Secretary).
„ V. S. Alwar,	

The meeting commenced as usual with Tea, when photographs from Illustrated Farm Science, New York, on Spray method of immunising chickens against Newcastle Disease and on growth noted in pigs with scientific feed supplements, like 'Aurofac' were circulated by the Chairman and discussed.

Tea over, the Chairman welcomed the members to this first meeting of the Managing Committee in the current year, and expressed his pleasure at the good attendance put in by members in spite of the strenuous nature of duties involved in their respective field of work. He took it as an indication of the great love and *esprit-de-corps* which the Association has been fostering from its very inception amongst the

members of the profession. Born on 23rd October 1920 at Vellore with only 15 members to start with, the Chairman said, the Association was nearly 37 years old now, and the present members are the torch-bearers of that great organisation to-day. He further added "Associations in general are the touch-stone of our culture and character both individual and national, and to the extent we bring to bear our spirit of co-operation, our spirit of give and take, our spirit of sacrifice, our strenuous efforts, etc., to that extent we stand to benefit and judged from that standard we may well feel proud of our record. With these introductory words he took up the agenda of the meeting.

1. The proceedings of the last meeting of the General Body held on 25-3-57, as published in the *I.V.J.* (May 1957) were read and confirmed.

2. The action taken on the Resolutions passed at the last meeting of the General Body was next explained by the Chairman. He said the resolutions were duly communicated to the Government through the Director of Animal Husbandry and that no reply was received so far.

Mr. Victor wanted more detailed information with regard to the exact nature of distinction made by the Turf Clubs in India, between Indian Veterinary Graduates and Members of the Royal College of Veterinary Surgeons. The Chairman explained that they do not accept certificates for registration of Race Horses from Indian Veterinary Graduates and sometimes insist upon even the identification certificates of imported animals being checked up only by M.R.C.V.S., men. However, to be sure of facts in this connection, the Chairman said he would address Mr. V. D. Ratnam, the sponsor of this resolution and get the facts and communicate later.

3. The Chairman next gave an account of the last Livestock Improvement Board meeting held at Pudukottai on 30-6-57 and the part played by the representative of the Association in the discussion of the various subjects on the agenda.

4. Next he informed the meeting that he met the Director of Animal Husbandry, Mysore and the Secretary of the Mysore Veterinary Medical Association, when last he was in Bangalore in June 1957 and that they are likely to arrange the Thirteenth All-India Veterinary Conference in December 1957 at Bangalore.

The meeting next took up for consideration (1) The present pay-structure of the profession, (2) The Registration Act of Veterinary

Practitioners, (3) Veterinarians and recruitment to Indian Administrative service and (4) Veterinarians on Legislative Bodies, and after complete discussion of all aspects of each subject, the following resolutions were passed unanimously:—

1. That this meeting is of opinion that the poor number of applications received this year for admission into the Madras Veterinary College is mainly due to the un-attractive scale of pay offered for an Intermediate in Arts, after 4 years and one term of intensive professional training or 5 years and one term after pre-university course and that the Government should take stock of the present position and future expansion of the Animal Husbandry Department and immediately raise the pay scale to Rs. 200 to Rs. 400 as already requested for by the General Body of this Association.

2. That this meeting is of opinion that there is undue delay in the passing of the Act on registration of Veterinary Graduates in Madras and that the President could ask for an interview with the Minister and discuss the subject and urge for an early passing of this Act.

3. That this meeting is of opinion that B.V.Sc. degree holders should also be made eligible for the Indian Administrative Service, as has been done in the case of several other professions, including B.E's and B.Sc's (Ag.) etc.

4. That this meeting is of opinion that the question of representation of Veterinarians on Legislative Bodies should be urgently considered by the Government and that choice of a nominee should be made in consultation with the All-India Veterinary Association, in the case of Parliament and the State Veterinary Associations in the case of State Legislative Councils.

15, Marshall's Road, }
Egmore, Madras-8. }

J. C. VICTOR,
Secretary.

THE MYSORE SERUM INSTITUTE, BANGALORE

Proceedings of the Staff-Meeting

The second monthly meeting of the Mysore Serum Institute, Bangalore was held in the Museum Hall of the Institute at 10 a.m. on 3-8-1957. All the officers of the Institute attended the meeting and the Superintendent Sri V. S. Kuppuswamy Mudaliar was in the Chair.

The Chairman reiterating the importance of the staff-meeting which served as a forum for discussion of scientific subjects of professional interest, requested everyone present to take an active interest in the deliberations. Calling upon Dr. Syed Mohiyuddeen to open the day's discussion on "Anthrax", stressed the importance of the disease which to this day posed many problems to the practitioner.

Opening the discussion Dr. Syed Mohiyuddeen said that this disease though the oldest to be recognised as an epidemic, was till to-day not completely understood and still called for further intensive study. Mentioning the four forms of the disease (*i.e.* peracute, acute, subacute and chronic) met with, he stated the subacute type was the most common he had come across in many epidemics in the Mysore State. Though usually sporadic in occurrence, the disease could assume an epidemic form occasionally. The field practitioner was prone to mistake it with other diseases like Haemorrhagic septicaemia and Blackquarter owing to swellings developing in dependent parts. These swellings contain a yellow gelatinous fluid. The subacute type lasted 2 to 3 days and in some cases up to 7 or 9 days. The temperature may not be apparent during the course of the disease. Organisms could be seen from thick smears made of the gelatinous fluid of the swelling. Not finding the organisms in the smears was not definitely indicative of the absence of the disease. Narrating his experience in the recent Anthrax epidemic in Supa (N. Kanara) he said the disease was recognised rather late and the transmission of the disease caused by the biting flies like *Tabanus* and *chrysozona* species common in that area and observed in large numbers in summer months. Another interesting fact he noticed was that in case of all the affected animals in the area, though they had similar symptoms and lesions, the organisms were not found in the smears and in the smears of a few animals which had temperature, dullness and other symptoms of cutaneous Anthrax after inoculation, did not reveal organisms in smears made on 4th day. He said that bacteraemia may not be always present while toxins may produce the deleterious effects of the disease and therefore presence of organisms in the peripheral blood smears could not be the only reliable criterion in the diagnosis of the disease. Regarding protection against the disease he said no biological so far assured a 100% guaranteed immunity though attenuated live cultures of anthrax as such or suspended in saponin proved to be the best. Another interesting point mentioned was that highly potent anthrax serum alone may give better result than serum with vaccine. He said the best way to control the epidemic was to conduct prophylactic inoculations in the endemic areas every year before the onset of the season which is usually the summer months between April and July when the fly breeding is highest. There

was still scope to work on finding out a better and safer vaccine because there had been instances of the disease showing up in vaccinated animals in actual outbreaks. As for treatment of the affected animals penicillin was the drug of choice. Penicillin alone had proved better than penicillin with serum. In some cases he pointed out that anthrax infection was exaggerated due to inter-current infection of Surra in some parts of Supa. Drs. C. K. Abdulla Khan, M. G. Sekharan, G. A. Hardikar and N. S. Krishna Rao participated in the lively discussion that ensued. Dr. Syed Mohiyuddeen answering some of the queries said that it was necessary to conduct suitable experiments to compare the efficacy of various anthrax biologicals in order to evolve a most efficacious vaccine.

With Dr. N. S. Krishna Rao proposing a vote of thanks the meeting terminated.

Review

A Text-Book of Meat Inspection.—By H. Thornton, B.V.Sc., M.R.C.V.S., D.V.H., F.R.S.H. Third Edition 1957. pp. viii x 592. Profusely illustrated in black and white colour. Price 60s. Publishers: Messrs. Bailliere, Tindall & Cox, Ltd., London.

The author who was Food and Hygiene Consultant of the WHO and FAO had the unique opportunity of making an extensive survey of Food Hygiene in many European countries, in the Middle East, in North and South America, in India, Ceylon, Burma and Iran. He has now brought out the third edition of his well-known book, Text book of Meat Inspection, incorporating some of his valuable findings and with 39 new illustrations, which are highly instructive not only to the student but also to the Meat Inspector.

Recent developments in matters concerned with Slaughter of animals are dealt with in this edition. The electric method of stunning including the Either method is completely discussed. The method of anaesthetising pigs, by carbon dioxide gas, prior to bleeding is described and this section also includes some unpublished observations on ritual methods of slaughter.

Much valuable material has been added to the Section dealing with food poisoning; and the procedure by which bacteriological examination of carcasses is carried out, is described in detail with suggestions as to how laboratory results should be interpreted by the Meat Inspector.

The section dealing with Tuberculosis in animals, as has been claimed, is no doubt largely rewritten and inclusion of standards of judgements applied by various countries to carcasses affected with Tuberculosis, makes it very instructive. The code of judgements recommended by the Bureau of Animal Industry of the U.S.A., with regard to the routine ante and post-mortem inspections is also included.

No section has been devoted to Fish and Fish Inspection which formed part of the 1949 and 1952 editions of this book as the author feels that adequate information is available now in some of the recently published works on this subject.

The book on the whole is a great improvement over its previous editions and the usefulness of the book is enhanced by its compactness.

F. D. WILSON.

TO OUR NEW GRADUATES

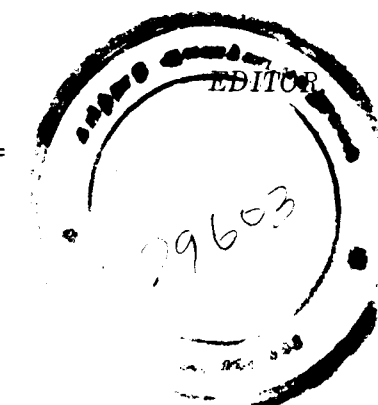
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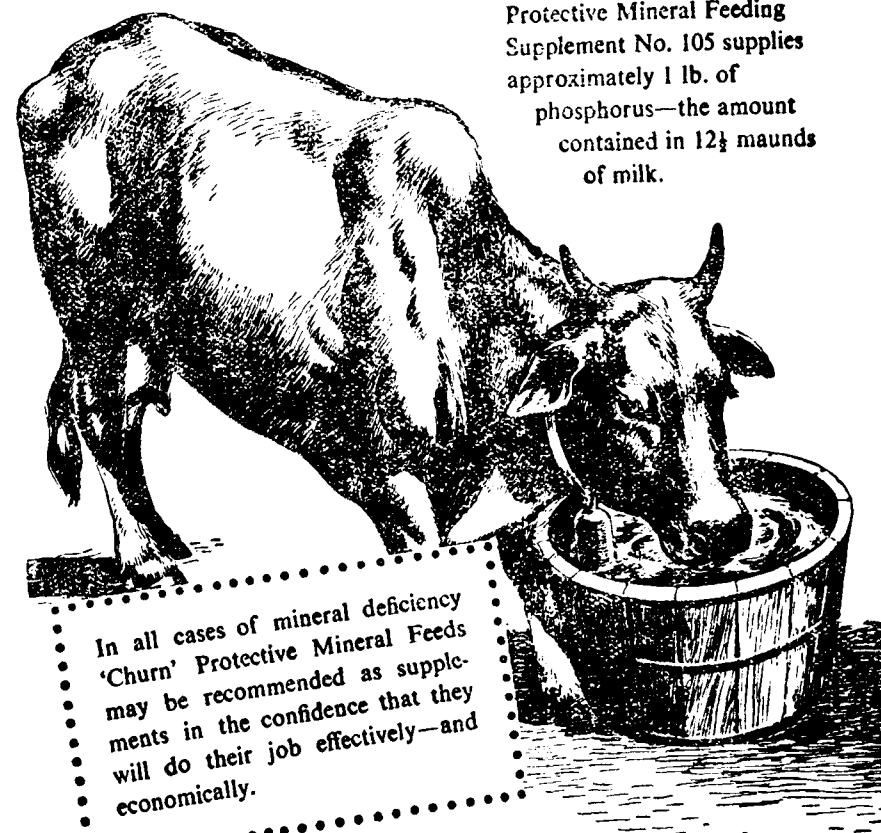
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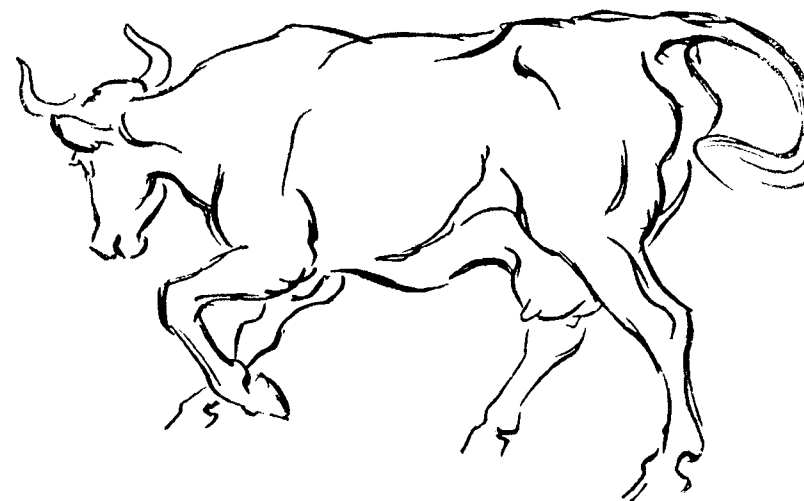
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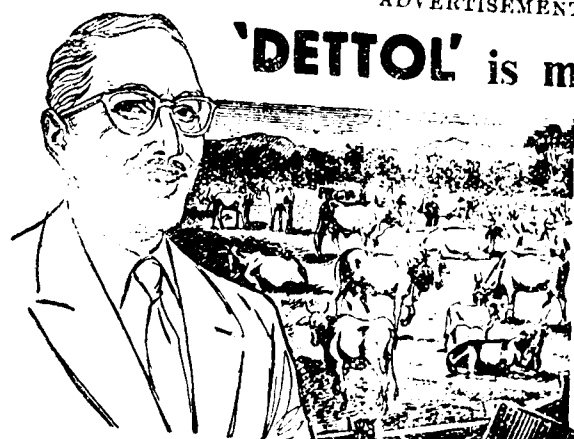
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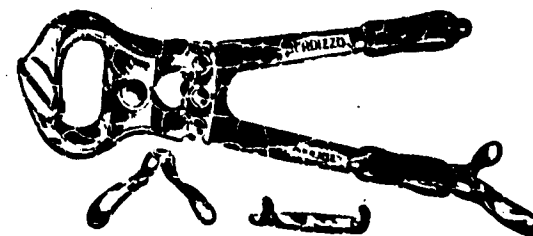
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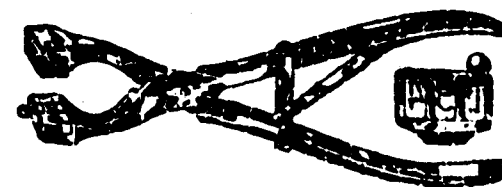
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