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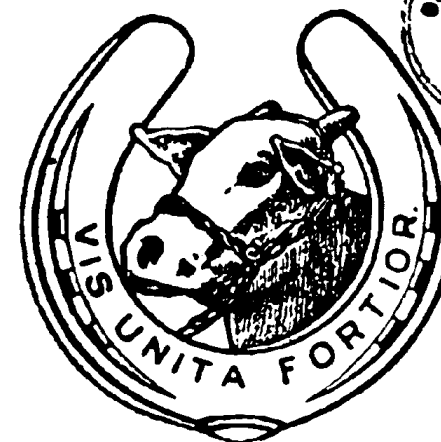
Vol. 35, No. 1

JANUARY, 1958

THE INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)

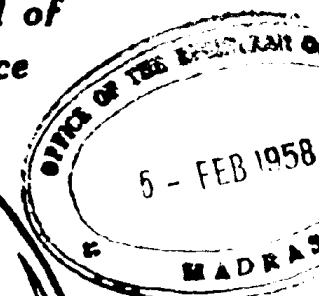
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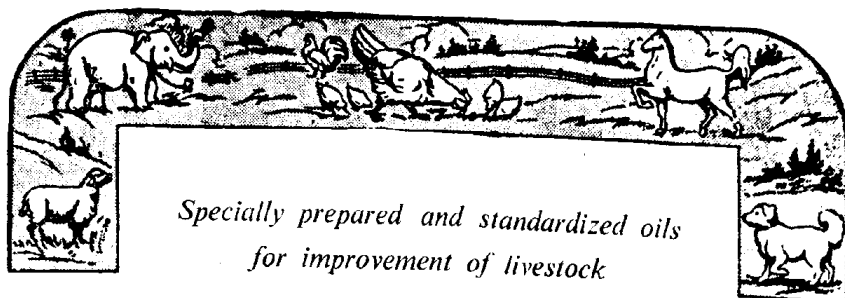


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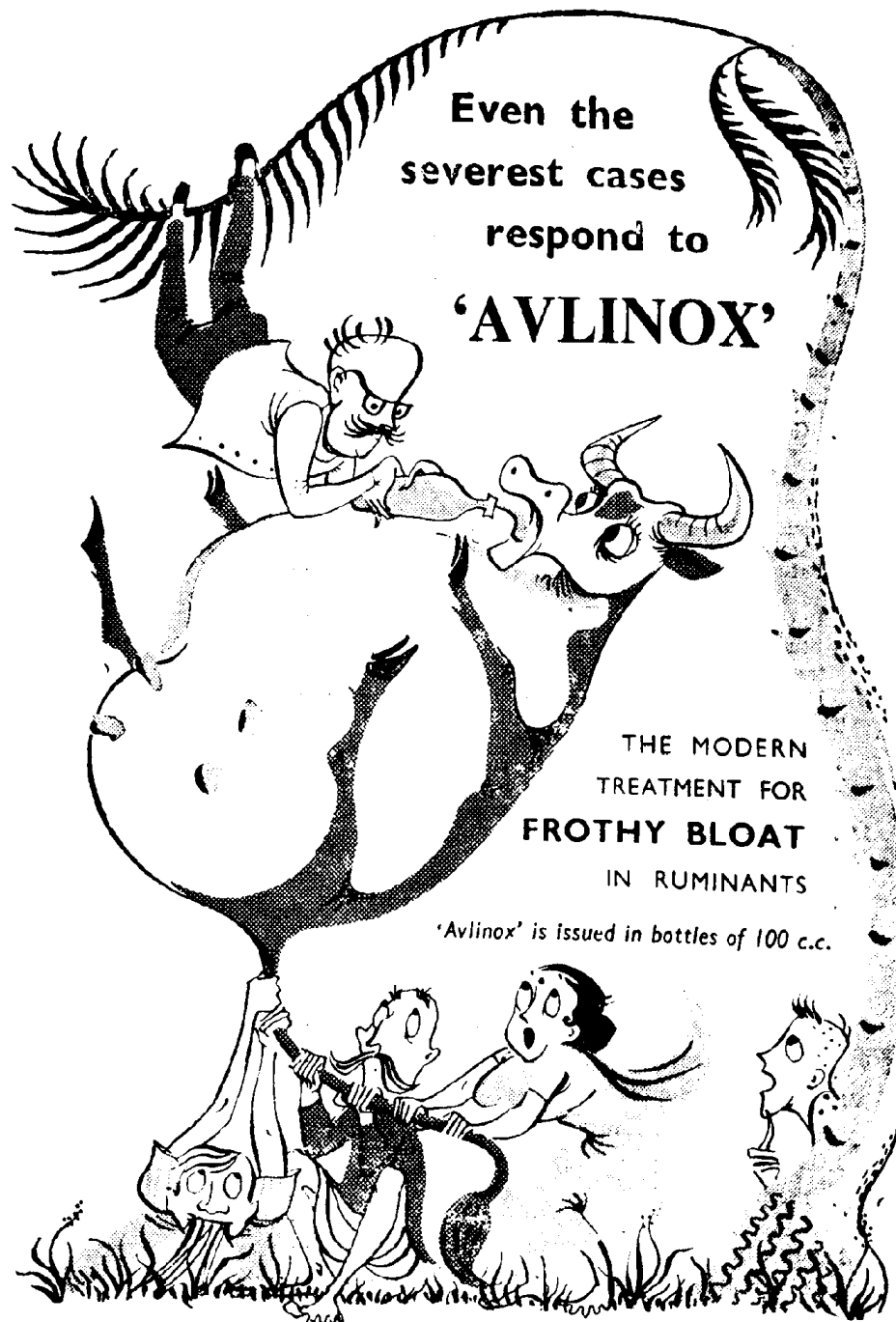
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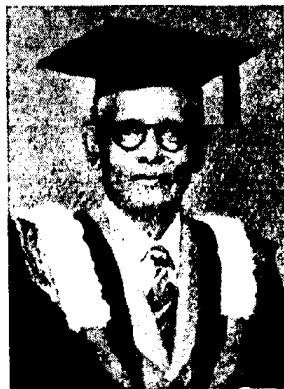
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THE Indian Veterinary Journal

(The Journal of the All-India Veterinary Association)

Vol. 35

JANUARY, 1958

No. 1

We Wish Our Readers
A Happy and Prosperous
New Year!

Editorial

RING OUT THE OLD, RING IN THE NEW

The above familiar line has not lost its charm because of its age. Many things in life we ring out and many new ones we ring in. And so the life goes on. The Old year is out and the New year is in, raising as usual new hopes in human breast. Ring out the false, ring in the true.

The *I. V. J.* has special reason to indulge in this song in the year of grace 1958. It is the year that has raised its status to that of a monthly. After 34 years of its existence, the *I. V. J.* has taken this cautious step of placing itself at the service of the profession as a monthly. Started as a quarterly in August 1924, it took nearly fifteen years to become a bi-monthly and now again after nearly nineteen years, it has fallen in line with other progressive professional Journals. It is a bold step and it may even be considered as a venturesome step, which the *I. V. J.* has taken. For it lacks the facilities and resources of similar publications in other countries; but it does not lack in one thing and that is, in its dominant will to place the name of India on the map of the Veterinary science of the world.

With reverential humility we dedicate the future of this Journal to the all-merciful Providence. We look up to the members of the profession to rally round the *I. V. J.* in larger numbers and extend their

patronage in a greater measure litererily. The next team of workers in this relay race of running this national Journal, must soon be getting ready. It is this peculiar heritage that is at once its strength and its weakness. Younger and stronger hands must come forward to take hold of the flag from withering hands. Let us hope they will do it.

NEMATOLOGY

We invite attention to a highly thought-provoking article on "Nematology in relation to Veterinary and Human medicine" that is appearing in this issue from the pen of that famous Scientist Dr. B. G. Chitwood.

Beginning with a handsome tribute to ancient knowledge, he takes us over some of the common fallacies that are prevalent amongst fieldworkers and draws attention to the fact that from point of taxonomy and life-history, the animal parasitologists have advanced much, but that the plant scientists have advanced much further in the matter of breeding for resistance and in studies of host range. But he strikes an optimistic note when he says that the recent trend of developments has been in the direction of resistance, immunity, host-parasite relationship and physiology of nemic parasites of both animals and man.

"Susceptibility to helminth diseases is certainly hereditary in some instances" says Dr. Chitwood and he was able to trace the heredity of susceptibility to tape-worms over four generations. Stating that an understanding of age resistance and host-parasite is coming slowly, he mentions the fact that workers in this field have shown that a high carbohydrate diet was necessary for the growth of the parasites and that phosphorus deficiency in diet definitely reduced the nemic infection etc. "Helminths have a primary and major carbohydrate metabolism. They all depend on their hosts for carbohydrates". He points out that the most recent phase of helminthological development has come to deal with the actual physiology of the parasites themselves. He envisages the possibility of establishing acquired immunity or resistance to nemic parasites.

The whole paper indicates a programme of work that may be pursued with advantage. It needs the team work of Micro-biologists, Geneticists, Nutritionists and the Bio-chemists. The field is vast and alluring and Dr. Chitwood has done well in drawing the attention of the profession to this important matter.

THE COMBINED VACCINATION

Fowl-Pox and 'Ranikhet' are the two diseases that still continue to cause grave concern to poultry breeders in this country. The Profession has been hard at work on these two diseases for sometime now and the production of an effective vaccine against Ranikhet disease is a major achievement in this field in recent years. But the Fowl-pox vaccine has been a little elusive. Conflicting reports have created quite a lot of confusion and loss of confidence. The vaccination against Fowl-pox has been 'under fire' all the time from the workers in the field. But it is now claimed that the egg-adapted Fowl-pox vaccine is a highly satisfactory product.

Mr. J.E. Lancaster, Veterinarian, F.A.O. Mission, Bangkok has expressed the same view in his letter, dated 16—8—56 published in the Indian Veterinary Journal of January 1957. He has been advocating strongly a Combined Vaccination against Ranikhet disease and Fowl-pox. But his method consists in giving the first vaccine intranasally and the second one by Wing-Web-Stab method at the same time. We publish in this issue an article on a Combined Vaccination against these two diseases by Mr. M. R. Dhanda and his Co-Workers. A similar work has also been recorded by Mr. A. R. Madhusudan in Madras in our November '57 issue. This Combined Vaccination is undoubtedly a great time-saving and labour-saving method. But the age limit of six to eight weeks in chicks seems to be the weak point. The birds are exposed to infection for a long period. They are not quite clear on this point.

Mr. Lancaster claims un-qualified success even with one-day old chicks. Any reduction in age limit should certainly be welcome and the spray-method of vaccination is perhaps waiting round the corner to be fully explored. We congratulate the workers and wish them further success in the field!

Production of vaccine is one thing but its use in the field is another, as was so pointedly put by Mr. Lancaster on another occasion. Use of mobile vans and systematic protection of birds in both urban and rural areas must be undertaken by the Animal Husbandry department of the several states. Otherwise the labours of such scientific workers will fall short of the ultimate benefits to be derived.

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The Silver Jubilee Number of the *Indian Veterinary Journal* (July 1949) is offered to the Members of the profession and students at a concessional rate of Rs. 3/- (Reduced from Rs. 5/-) Postage extra. Only a limited number of copies are available. Hurry up to avoid disappointment! It contains the genesis and growth of (1) all the State Veterinary Departments in India and Pakistan; (2) all the Veterinary Colleges in India; (3) the Indian Army Remount and Veterinary Services; (4) the I.V.R.I., (5) the A.I.V.A., (6) the *Indian Veterinary Journal*, as well as highly complimentary messages from all over the world.

There are special professional articles by Dr. G. Lapage; Dr J. O. L. King; Dr. S. Datta; Dr. M. R. Dhanda and Dr. V. R. Rajagopalan; Dr. S. G. Iyer and Dr. C. S. Balakrishnan and Dr. S. N. Yeravdekar.

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General Articles

VOGELOIDES ramanujacharii n.sp., A NEW LUNGWORM FROM THE DOMESTIC CAT (*Felis catus* Linne), IN INDIA *

BY

V. S. ALWAR and C. M. LALITHA
Madras Veterinary College, Madras,
and

P. SENEVIRATNA
Royal Veterinary College, London.

While studying parasitic infections in domestic cats in Madras, small and slender whitish thread-like nematodes were recovered from the lungs of 12 cats out of the 50 examined. Two of the infected ones were 4-6 months old kittens. Each cat harboured one to four helminths only, except two adults, from each of which about a dozen worms were recovered. About 60 per cent of the worms could be recovered as bits only, while the rest were obtained intact. There were more females than males. No gross pathological lesions were observed in the lungs and a very careful and thorough search was found necessary to detect the infection. These helminths are considered to be a new species of *Vogeloides* and their description is given below:

Vogeloides ramanujacharii n.sp.: Metastrongyloidea Lane, 1917, Filaroididae Schulz, 1951, Vogeloidinae Dougherty, 1951; the helminths possess a smooth and delicate cuticle, which is expanded on the lateral aspects and is wrinkled quite often. The mouth is bounded by six well developed lips, which bear altogether ten papillae. The buccal capsule is rudimentary and non-sclerotised. The oesophagus starts 10-12 μ from the anterior extremity and consists of a short narrow anterior portion and a long wide posterior portion. Cervical papillae are not present. Nerve ring is situated at about the middle of the anterior portion of oesophagus, 100-155 μ from the anterior end and is 16-25 μ broad. Excretory pore lies slightly anterior to the junction of the anterior and posterior portions of the oesophagus. The tail is bluntly pointed.

Males: They measure 7.5-15.3 m.m. long and 0.096-0.165 m.m. broad. The width of the head is 30-35 μ . The anterior and the

* Presented to the 12th Madras State Veterinary Conference, 1957.

posterior portions of the oesophagus are 160-245 μ and 250-380 μ long and 25-32 μ and 48-75 μ broad respectively, the total length being 410-600 μ . The excretory opening is situated 165-220 μ from the head end. Caudal end is spirally coiled and the length of the tail is 28-60 μ . Caudal bursa is lacking. A pair of yellowish brown, similar, subequal, alate, scimitar shaped spicules are present. They measure 146-180 μ and 156-190 μ long respectively and are 8-10 μ broad. The difference in length of the two spicules ranges from 10 to 20 μ . The proximal end of the spicule is thickened with a knob like hooked process and the distal end is rather blunt. Along the whole body of the spicule runs the wing, broadest in the middle. Gubernaculum is linear and slightly curved and is 20-30 μ long and 4-5 μ broad. Its proximal end is broader than the distal extremity. Cloacal papillae are indistinct and two pairs of precloacal and two pairs of postcloacal papillae only are observed.

Females: They measure 13.4-30.6 m.m. long and 0.192-0.26 m.m. broad. The width of the head is 30-40 μ . The oesophagus is 528-710 μ long; 186-285 μ X 30-40 μ and 342-430 μ X 48-85 μ being the measurements of its anterior and posterior portions respectively. The excretory opening is situated 190-250 μ from the head end. The tail is straight and the anus is 78-105 μ from the caudal end. The vulva opens anterior to the anus, 158-225 μ from the caudal extremity and 80-120 μ from the anus and is placed on a prominent elevation. Vagina is 60-65 μ broad and 981-2200 μ long. Uterus occupies the posterior 3/4ths or even the 4/5ths of the worm and is filled with numerous eggs. Those present in the terminal portions of the uterus are all embryonated. The egg is oval, thick shelled and measures 40-45 μ X 25-32 μ .

Hosts: Domestic cat, *Felis Catus* Linne.

Location: Lungs.

Locality: Madras, India.

Type specimens: In the Helminthology museum of the Department of Parasitology of the Madras Veterinary College.

Discussion

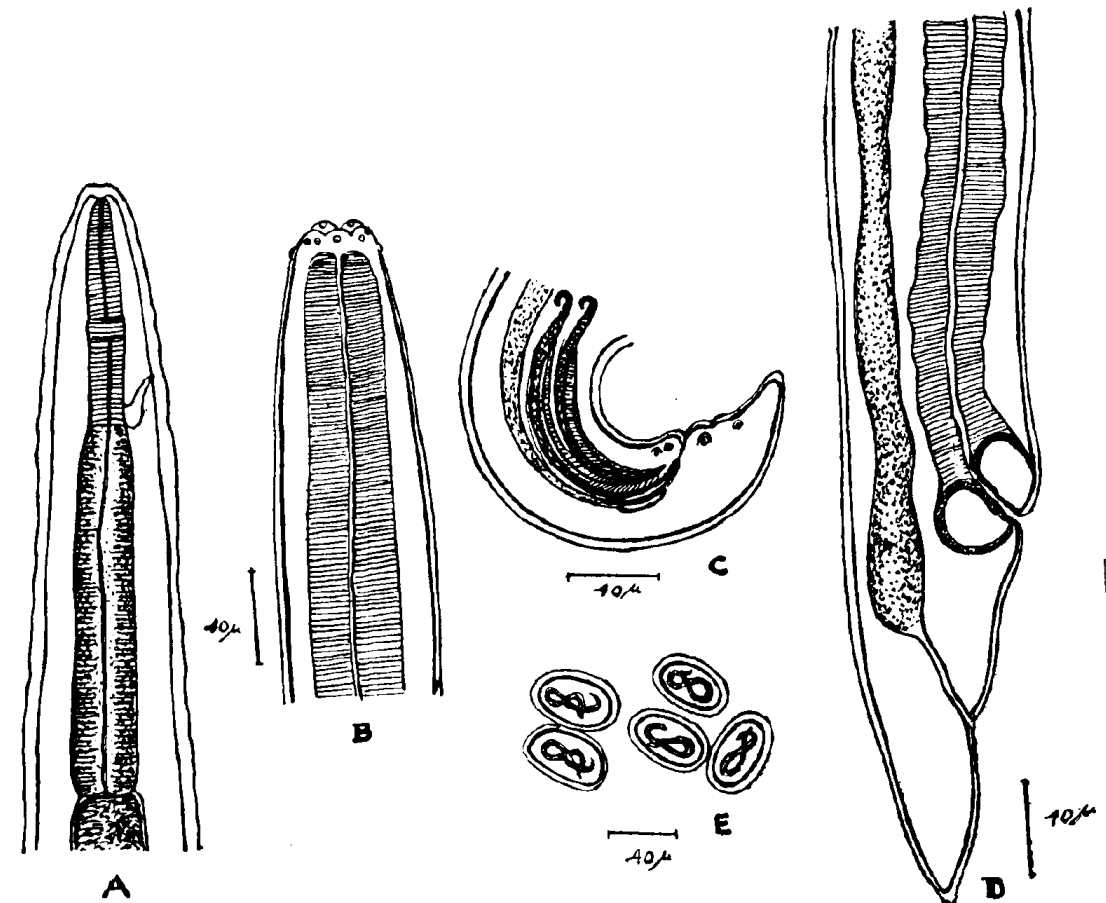
A study of the different species of *Vogeloides* described so far (Table I) reveals some resemblances of *V. ramanujacharii* to *V. massinot* (Davtian, 1933) as regards the gross morphology and the host. But a detailed comparative study of these two species reveals significant differences (Table 2). The new species shows the following differentiating features: 1. The females are shorter and slender. 2. Cervical papillae are absent. 3. The excretory opening is in the anterior portion

VOGELOIDES ramanujacharii n.sp.

By

V. S. ALWAR, C. M. LALITHA and P. SENEVIRATNA

Camera lucida drawings



- A. Anterior end, lateral view.
- B. Dorsal view.
- C. Posterior end of male, lateral view.
- D. Posterior end of female, lateral view.
- E. Eggs.

VOGELOIDES ramanujacharii n.sp.

By

V. S. ALWAR, C. M. LALITHA and P. SENEVIRATNA

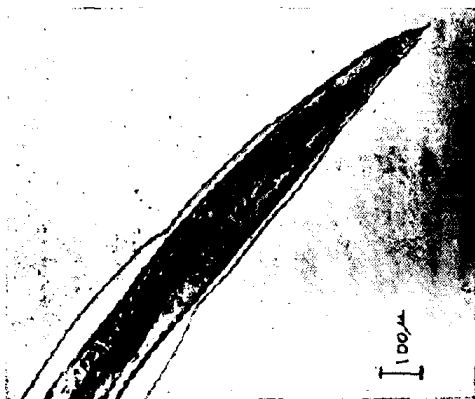
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Fig. 8.



Fig. 5.

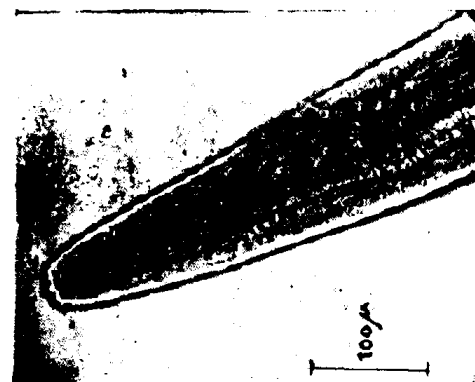


Fig. 2.



Fig. 4.

1 and 2 Head end.
3 and 5 Tail end of female.
4. Tail end of male.

TABLE I

The morphological data and other particulars of the recorded species of Vogeloides Doughterty, 1952.

(All measurements are in millimeters)

Species	V. ascaroides (v. Linstow, 1879)	V. sorillae (Seurat, 1919)	V. massinai (Davtian, 1933)	V. cocophaga (Grichner, 1948)	V. serralis (Chaubaud & Biocca, 1950)	V. exilis (Biocca & Chaubaud, 1952)	Vogeloides ramanujacharii n.sp.
Host	Mora guenon	Vaillant's zoril. Algiers	Domestic cat Armenia	Mongoose Palestine	Felis serval Somaliland	Herpestes caffer Eritrea	Domestic cat Madras
Distribution							
Male:							
Total length	11.000	9.400-11.000	8.000-14.000	6.600-6.800	7.100-8.000	10.250	7.500-15.300
Maximum width	0.420	0.400-0.410	0.126-0.173	0.260-0.250	0.380	0.110	0.096-0.165
Length of oesophagus	0.857	0.890-0.440	0.460-0.560	1.000-1.200	0.490	0.360	0.410-0.600
Length of spicules	0.180		0.175-0.210	0.210-0.230	0.375	0.130-0.150	0.146-0.190
Length of gubernaculum			0.030-0.040	0.038-0.039	0.070	0.025-0.035	0.020-0.030
Caudal papillae:							
Preanals	4 pairs		3 pairs	1 pair	3 pairs	4 pairs	2 pairs
Adanals		Third stage larvae only described	1 unpaired	1 unpaired	1 unpaired	1 unpaired	
Postanals	2 pairs		6 pairs	7 pairs	2 pairs	6 pairs	2 pairs
Female:							
Total length	13.000	9.400-11.000	26.00-40.000	7.800-8.200	11.600-15.400	20.000	13.400-30.600
Maximum width	0.450	0.400-0.410	0.220-0.376	0.346-0.370	0.700	0.150	0.192-0.260
Length of oesophagus	0.857	0.890-0.440	0.460-0.560	1.260-1.270	0.620	0.450	0.525-0.710
Length of vagina		4.200-4.800					
Length of tail	0.078		7.370	1.000-1.100	1.100-1.200	2.000	0.981-2.200
			0.096-0.114	0.100	0.065	0.065	0.078-0.105

TABLE II

The detailed comparative morphological data of
V. massinot and *V. ramanujacharii* n.sp.

Particulars	<i>V. massinot</i>		<i>V. ramanujacharii</i>	
	Male	Female	Male	Female
Total length	m.m. 8.000-14.000	m.m. 26.000-40.000	m.m. 7.500-15.300	m.m. 18.4 - 30.6
Maximum width	0.135- 0.176 μ	0.220-0.370 μ	0.096- 0.165 μ	0.192- 0.26 μ
Width of the head	No separate measurements		80-85	30-40
Distance between the anterior extremity and the beginning of oesophagus.	36-42 120-18		10-12	10-12
Oesophagus:				
Length of ant. part	180-220		160-245	186-285
Width of ant. part	28-35		25-32	30-40
Length of post. part	315-345		250-380	342-430
Width of post. part	70-98		48-75	48-85
Total length	460-560		410-600	528-710
Distance of excretory opening from the head end	180-338		165-220	190-250
Distance of nerve ring from the ant. end	85-110		100-155	105-155
Cervical papillae	present		not present	
Length of tail	39-51	96-112	28-60	78-105
Spicules:			146-180;	
Length	175-210		156-190	
Breadth	11-14		8-10	
Difference in length between the two	10-30		10-20	
Length of gubernaculum	30-40		20-30	
Caudal papillae:				
Preanals	3 pairs		2 pairs	
Cloacal	1 unpaired			
Postanals	5 pairs		2 pairs	
Distance of vulva from anus		106-130		80-120
Distance of vulva from tail end		204-250		158-225
Length of vagina		7370		981-2200
Size of eggs		38-58 X 25-34		40-45 X 25-32

of the oesophagus. 4. The vagina is short. 5. Only two pairs of precloacal and two pairs of postcloacal papillae can be noticed. 6. The oesophagus is longer. 7. The spicules are shorter and narrower. 8. The division of the spicules as well as their alae at the distal end are absent. 9. The gubernaculum is shorter. 10. The length of the tail of the female and the distance of the vulvar opening from the posterior extremity are shorter. 11. The eggs are slightly smaller. Hence the helminths described in this paper are considered as a new species and have been named *Vogeloides ramanujacharii* after the late Sri G. Ramanujachari, Professor of Parasitology, Madras Veterinary College.

The record of *Vogeloides ramanujacharii* from cats brings the number of lungworms from this host to four, the other three being (1) *Aelurostrongylus abstrusus* (Railliet, 1898) Cameron, 1927; (2) *Vogeloides massinot* (Davlian, 1933) Dougherty, 1952; and (3) *Anafilaroides rostratus* Gerichter, 1949.

Summary

A new species of lungworm, *Vogeloides ramanujacharii* n.sp. is described from the domestic cat in Madras. This species is differentiated from the other valid species of *Vogeloides*.

Acknowledgments

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IMMUNIZATION OF FOWLS WITH COMBINED FOWL POX AND RANIKHET (NEWCASTLE) DISEASE VACCINE

By

M. R. DHANDA, P. R. NILAKANTAN,
and

SAKKUBAI PATURI,
Indian Veterinary Research Institute, Mukteswar.

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Fowl pox and Ranikhet disease are two of the important maladies of fowls which cause considerable loss to the poultry industry in India. Few fowls will, perhaps, escape infection with viruses of these diseases unless they are properly immunized. It is a common practice, especially, in organized farms in this country to immunize chicks at six weeks of age with the Ranikhet disease vaccine and vaccinate them again with the fowl pox vaccine after a further period of two to four weeks. This

practice entails repeated handling of chicks and necessitates their being kept at the farm for longer periods before distribution. Further, the chicks are in a susceptible state to fowl pox for a longer period. It would be to great advantage, if vaccination against both the diseases could be carried out simultaneously.

Use of more than one prophylactic agent in a combined form for prevention of diseases is not uncommon in preventive medicine. Komarov, *et al* (1948), Prier (1951), Deply and Hars (1953), Verge (1954), Weidenmuller (1954) and Cordier, *et al* (1955) have recorded successful use of combined fowl pox and Newcastle disease vaccine in poultry. However, Jansen and Vlerk (1954) pointed out that with a commercial vaccine recommended for use against both fowl pox and Newcastle disease, immunity was established only against the former and not against the latter.

The following is a report of the work carried out to determine the efficacy of combined fowl pox and Ranikhet disease vaccination in fowls.

Materials and Methods

Fowl pox vaccine:—Egg-adapted strain of fowl pox virus described by Rao, *et al* (1953) was used throughout the study. The strain was being maintained by us for more than two years and had undergone 95 serial passages in eggs when used in this study. For preparation of the vaccine, 12 to 13-day old embryonating hens' eggs were inoculated by membrane method with the above mentioned strain of virus. Eggs thus infected were incubated for four days at 37°C. Chorioallantoic membranes from only those eggs which had living embryos and showed satisfactory lesions were collected. In the first few trials, vaccine was prepared by making a suspension of the membranes in equal quantity of allantoic fluid from infected eggs and then freeze dried. Further trials were carried out with the vaccine prepared from the chorioallantoic membranes only, without the addition of any diluent. The wet vaccine was ampouled in 0.5 ml. quantities and freeze dried.

Ranikhet disease vaccine:—Mukteswar (R₁B) strain of Ranikhet disease vaccine virus was used in this study. The strain had undergone 350 serial passages in eggs when used in this study. The strain kills the infected embryos in less than 48 hours but not before 24 hours. It produces haemorrhage in the brain, oedema under the skin and petechiae on the ventral surface of the embryos. Ten-day old embryonating eggs were infected with the strain of virus by the allantoic route. Forty-eight hours after incubation at 37°C. the chorioallantoic membranes, allantoic fluid and embryos were collected, suspension made in a waring blender and freeze dried in 0.5 ml. quantities.

Combined fowl pox and Ranikhet disease vaccine was prepared by mixing equal quantities of the two vaccines in a waring blender and then freeze drying in ampoules in 0.5 ml. quantities.

Reconstitution of the vaccines and method of vaccination:—Freeze dried vaccines were reconstituted by adding 1.0 ml. of 50 per cent glycerine saline solution to each ampoule in the case of the fowl pox and Ranikhet disease vaccines and 0.5 ml. in the case of the combined vaccine. Excepting in one instance 'prick' method was used for vaccinating birds. The 'stick' used for the purpose consisted of an ordinary stitching needle mounted on a small wooden handle. The eye end of the needle was sharpened so that it would be convenient for pricking. When the 'stick' was dipped in the vaccine a droplet of it was carried in the eye of the needle. Usually, two pricks were given in the wing web of the birds after dipping the stick in the vaccine before each prick. Seetharaman and Nilakantan (1953) have indicated the efficacy of the different methods of immunizing birds against Ranikhet disease with the strain under reference.

Methods of challenge: (a) *Against Ranikhet disease*:—A virulent strain of Ranikhet disease virus maintained by monthly passages in fowls was used to challenge the vaccinated fowls. The dose consisted of 1.0 ml. of a one per cent suspension of liver and spleen from fowls dead of infection with the strain. The fowls thus infected, if susceptible, invariably died in about 4 to 5 days and showed typical haemorrhagic lesions in the proventriculus and ulcers in the intestines.

(b) *Against fowl pox*:—A strain of the virus maintained by serial passages in fowls by feather follicle method was used for challenging vaccinated fowls. A two per cent suspension in 50 per cent glycerine saline of scabs containing the virus was applied to the defeathered follicles in the region of the thigh of the fowls to be challenged. In susceptible fowls the virus produced swelling of the follicles in three days leading to profuse scab formation in 7 to 10 days. Partially immune birds showed slight swelling and scab formation in a few of the follicles exposed to the infection. Immune birds showed only a slight swelling of the follicles which might occur due to the rubbing of the suspension containing the virus and which subsided in about 4 to 5 days.

Experimental

Trial I:—Twenty chicks of ten weeks of age were vaccinated by 'prick' method in the wing web with the combined vaccine. On the third day after vaccination reddening and slight swelling at the site of prick were noticed, which formed into well developed vesicles in the course of 5 to 7 days and then dried to form scabs in 10 to 12 days.

Scabs fell off in about a week thereafter. This type of reaction constituted satisfactory 'take' to fowl pox virus.

Two weeks after vaccination ten of the chicks were challenged along with two unvaccinated controls with virulent Ranikhet disease virus. Both the controls succumbed to the infection while all the vaccinated chicks resisted the challenge. The remaining ten chicks were challenged with the fowl pox virus three weeks after vaccination along with four controls. All the control chicks reacted typically showing profuse scab formation while two of the vaccinated chicks showed a mild reaction and the rest of the chicks resisted the challenge.

Trial II:—Twenty chicks of ten weeks of age were vaccinated subcutaneously with 0.5 ml. of one per cent suspension of the combined vaccine. Excepting four the rest of the chicks showed satisfactory 'take' at the site of inoculation. Half the number of chicks were challenged with virulent Ranikhet disease virus and all of them remained unaffected while the control chicks succumbed to the infection. The rest of the chicks were challenged with fowl pox virus along with four controls. The control chicks reacted typically while all but one of the vaccinated chicks were found resistant.

Trial III:—Three groups, A, B and C comprising of 24, 24 and 48 fowls were vaccinated by the prick method with the Ranikhet disease, fowl pox and combined vaccine respectively. All the fowls in groups B and C showed satisfactory 'take'. Birds in groups A and C were bled before vaccination and on the 7th and 14th day after vaccination and their sera subjected to haemagglutinin-inhibition (HI) test against Ranikhet disease virus. The results of the test are given in table I.

TABLE I

HI titre of sera of birds vaccinated with Ranikhet disease vaccine and combined vaccine.

Vaccine	Average HI titre		
	Before vaccination	After vaccination	
		7th day	14th day
Ranikhet disease vaccine	1 : 0	1 : 740	1 : 5120
Combined vaccine	1 : 0	1 : 864	1 : 5585

Two weeks after vaccination all the birds in group A and half the number of birds in group C were challenged with the virulent Ranikhet disease virus along with four unvaccinated controls. While the control

birds succumbed to challenge the birds of both the vaccinated groups were found resistant.

All the birds in group B and the remaining half the number in group C were challenged with the fowl pox virus along with twelve controls. While all the controls reacted typically, three of the birds in group B and two in group C showed a mild reaction and the rest were found to be immune.

Trial IV:—Chicks of about six weeks of age and mostly of Rhode Island red and White Leg Horn breeds were used in this trial. Three hundred and eight chicks were vaccinated with the fowl pox vaccine, 65 with Ranikhet disease vaccine and 350 with the combined vaccine. In all the cases the vaccinations were done by 'prick' method.

All the chicks vaccinated with the combined vaccine and all but three vaccinated with fowl pox vaccine showed satisfactory 'take'. There was no evidence of generalization attributable to fowl pox virus in any of the chicks.

One of the chicks immunized with the Ranikhet disease vaccine alone and two of the chicks immunized with the combined vaccine showed nervous symptoms. Haemagglutinin inhibition (HI) titre of sera of some of the vaccinated chicks were ascertained and are presented in table II.

TABLE II

HI titre of sera of chicks vaccinated with Ranikhet disease vaccine and the combined vaccine.

Number of chicks	Type of vaccine	Period of collection of blood after vaccination	Average HI titre
20	— R. D. combined vaccine	nil	1 : 0
10		14 days	1 : 5120
10		14 days	1 : 5120
9		45 days	1 : 1707
10		3 months	1 : 576
1		4 months	1 : 880
4		8 months	1 : 187

Results of immunity tests carried out on a few chicks from each vaccinated lot are presented in table III. The controls used for immunity tests were of the same age group as the vaccinated ones.

TABLE III

Results of the immunity tests on chicks immunized with Ranikhet disease, fowl pox and the combined vaccines.

Number of chicks	Type of vaccine	Period after vaccination	Challenge virus	Number of reactors	Protection percentage
5	R. D.	14 days	R. D.	0	100
5	combined	14 days	"	0	100
2	—	—	"	2	0
6	F. P.	14 days	F. P.	0	100
6	combined	"	"	0	100
4	—	—	"	4	0
5	R. D.	21 days	R. D.	0	100
5	combined	"	"	0	100
2	—	—	"	2	0
6	F. P.	21 days	F. P.	0	100
5	combined	"	"	1	80
4	—	—	"	4	0
6	F. P.	3 months	F. P.	1	83.3
6	combined	"	"	2	66.7
4	—	—	"	4	0
7	F. P.	7½ months	F. P.	0	100
4	combined	"	"	0	100
4	—	—	"	4	0
4	combined	8 months	R. D.	0	100
1	—	—	"	1	0

Discussion

In using combined vaccines against two diseases, especially, when living organisms are employed the two factors which merit consideration are (i) whether the combination of the two vaccines is safe for use in comparison to the individual vaccines and (ii) whether the immunogenic response in the individuals receiving the antigens in a combined form compares favourably with that in individuals receiving the two antigens separately. In the present study, the use of the combined vaccine appeared to be safe and there was no indication that either of the strain used exaggerated the virulence of the other.

As regards the efficacy of the combined vaccine, it may be pointed out that in this study 34 birds immunized with the Ranikhet disease vaccine alone, 58 birds immunized with the combined vaccine and 11 unvaccinated birds were subjected to challenge with the virulent Ranikhet disease virus; all the vaccinated birds died of the challenge infection while all the vaccinated birds in either case proved to be immune. Further, 49 birds immunized with the fowl pox alone, 65 birds immunized with the combined vaccine and 32 unvaccinated birds were

challenged with the fowl pox virus; all the control birds reacted typically to the infection, while 4 (8.16%) of the birds protected with fowl pox vaccine and 3 (12.3%) of the birds with the combined vaccine reacted mildly to the challenge. Thus the difference between the percentage of reactors in the group of birds which received individual vaccines and in that which received the combined vaccine, as compared to the percentage of reactors amongst the unvaccinated control birds is highly significant and indicates that the use of combined vaccine is as efficacious in affording protection against both the diseases as each of the two vaccines used separately.

Summary

Vaccination trials were carried out with the freeze dried fowl pox, Ranikhet disease and the combined vaccines.

Immunogenic response against Ranikhet disease in case of birds vaccinated with the combined vaccine was as good as that in the birds vaccinated with the Ranikhet disease vaccine alone as determined by the development of Haemagglutinin-inhibition titre in the sera of vaccinated birds and as ascertained by immunity tests with virulent Ranikhet disease virus.

Immunogenic response against fowl pox in case of birds vaccinated with the combined vaccine was as good as that in case of birds vaccinated with the fowl pox vaccine alone as ascertained by challenge tests.

Observations indicated that when used in combination there was neither any interference between the two viruses used nor any exaggeration of virulence in either of them.

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NEMATOTOLOGY IN RELATION TO VETERINARY AND HUMAN MEDICINE

By

B. G. CHITWOOD, Ph.D.,

Chief Nematologist, State Plant Board of Florida (U.S.A.)

The subject of nematology had its historic origin in human medicine which developed with the Hebrews, Egyptians, Greeks and thence with the various European civilizations. Some of the early observations on nemas, diseases and remedies were remarkably good. In fact, modern science has "discovered" much ancient or medieval knowledge only in recent years. Thus santonin, areca nut, garlic as anthelmintics as well as milk were prescribed by earlier civilizations while most of our ancestors were dwelling in caves. This is said in order to emphasize the point that in recent years it has become customary for scientists to preen themselves with the tremendous progress of our times and to cast aspersions at folk lore, superstitions, and old wives' tales of the past. Besides reminding you of the early remedies the author would also cite two examples.

Some 20 years ago he was privileged to guide a Brahmin M. D. in this country studying public health. In the course of our work we discussed many types of things. The Brahmin's being the older civilization, the author was much interested to hear that the wisdom of their early sages had prescribed the pilgrimage to the Ganges and incorporated it into their religion as a public health measure. Though the Ganges is probably one of the most polluted streams on the face of the earth, those who make the pilgrimage and drink of its waters have a greater life span. Modern science now explains this, for the Ganges is said to be the greatest source of bacteriophage on earth and in a civilization scourged with cholera and dysentery a good inoculation of bacteriophage in the gut definitely has its points.

The second example is more modern and indeed somewhat personal. In writing of the historic development of our knowledge the author used the Copenhagen Academy of Science Award (1788) to Bloch on the subject "Are Intestinal worms inborn or do they reproduce their own kind" as a miscarriage of justice. The contestant who maintained they were inborn won the award. Most of us disparaged the prevalent opinions of animal husbandrymen over the centuries. We now know that ascarids and hookworms can be inborn if the mother becomes infected at the right stage of pregnancy.

Animal Husbandry and Plant Husbandry are indeed parent sciences to all agricultural sciences and we should not forget their

position. Certainly we may well suspect a Hebrew shepherd (Jacob) as the earliest animal geneticist for he saw to it that his father-in-law's flock became spotted.

Aristotle recorded the fact that dogs, when they are sick eat standing corn. Well-trained kennel men have fed dogs in pens, grass or other greens daily for at least 150 years. Now within the past 10 years the manufacturers of dog food have learned to incorporate such materials as alfalfa in their products.

In talking with the various people at the universities concerned in plants and animals parasitized by nemas, the author has found some of the attitudes, ideas and comparisons interesting.

First, of course, from the standpoint of taxonomy and life history it is undoubtedly true that the animal phases of the science are much further advanced. That is reasonable because the worms are usually larger, there are more animal parasitologists, and there are fewer domestic animals than plants.

The plant sciences are, however, much further advanced in the matter of breeding for resistance and in studies of host range. Animal parasitologists usually ignore the possibility of breeding for resistance and there is little point, as a general rule, in studying host range. One member of a staff remarked that they had no host specificity. This is, of course, erroneous. There are still some rather interesting problems in host and even tissue specificity in domestic animals. We need cite only the cases of *Ascaris lumbricoides* of man and *A. suum* of swine, of *Necator americanus* of man and *N. suilla* of swine, *Enterobius* of man and primates, *Anchylostoma* of cat, dog and man. Man apparently got these parasites from his domestic animals and strains arose which have been given specific rank. Cross infection today is difficult. We still do not understand it.

The greatest developments in the field of nemie parasites of domestic animals and man in recent years have been in the knowledge of resistance, immunity, host-parasite relationships and physiology.

Genetics has been largely ignored but we feel this has been a mistake. Susceptibility to helminth diseases is certainly hereditary in some instances. In our own case we were firmly convinced of this point by dog breeding experiences. It is well known that tapeworms are often present in large numbers in apparently healthy dogs and sheep. In fact the literature is crowded with observations and experimental data of a conflicting nature. One might reasonably ask whether or not these organisms are pathogenic.

In one particular blood line we were able to trace the heredity of susceptibility to tapeworms over four generations. Susceptible animals were high strung and neurotic, suffered from defective calcium metabolism and bitches with tapeworms had eclampsia and fits during the nursing period. Other animals of the same general blood line, but of a different physiological type were not bothered by tapeworm infection. This tendency was hereditary and needless to say, all animals were raised together, suffering the same exposure.

A major fault in the experimental work as published today in the study of helminth diseases of large animals is the lack of sufficient numbers, rare use of identical twins (best done with sheep) and the use of genetically impure stocks. In this feature, studies on helminth diseases of chickens and plants are more advanced and better controlled. The importance of genetic consideration is best brought out by the observations of Whitlock (1948) on trichostrongyliasis of sheep. This author found iodized salt tends to prevent the diarrhoea accompanying trichostrongyliasis. The few cases developing in a flock show enlarged thyroids with typical colloidal goitre. When a ewe was fed ordinary salt during pregnancy and twin lambs were put on thiouracil, one being kept free of worms while the other became infected, he reported the infected lamb died of trichostrongyliasis and exhibited a colloid-free goitre. Tendency to thyroid trouble is known to be hereditary. Development of symptomatic trichostrongyliasis is notoriously erratic. It would appear that this worker may well have the answer. Breed better sheep.

An understanding of age resistance and obscure host-parasite relations is coming slowly. In rats resistance to some nemas was found to depend on mucus secretions of the goblet cells. These increased with age. Their development was also dependent on the thyroid. Artificial "immunization" by feeding mucus caused worms to pass out just as if resistance had been developed.

Ackert and co-workers over a period of some 30 years have advanced the study of host-parasite relations and resistance in chickens to *Ascaridia galli* further than any other parasite. Among other points they showed a high carbohydrate diet necessary for the growth of the parasite, phosphorus deficiency in the diet definitely reduced the nematode infection, a diet of skim milk produced a marked reduction of parasitism and finally by injecting 0.15 mg of tulinius toxin per kilo of body weight they found that the effects of the toxin were increased when fowls were infected with *Ascaridia*. Peculiarly enough, they also found that growth of the worms was reduced in toxin-injected fowl.

Spindler, Zimmermann and Hill (1944) found pigs fed on skim milk lost 61-100% of their whipworms, 91-100% of their nodular worms and

0-94% of the ascarids. Leese (1943) similarly found that colts fed on cow's milk had a distinct reduction in their strongyle burden.

Ackert & Riedel (1951) tested milk as a preventative for *Trichinella spiralis* in mice but in this case milk was only substituted for water in the ration. Little difference in the development of adult *Trichinella* was observed but the numbers of larvae in the diaphragms were reduced 35%.

Kates and Turner (1951) investigated the pathogenicity of *Nematodirus spathiger* to sheep. Administration of 300,000 larvae per day over 3 days produced diarrhoea, anorexia and retarded growth after the second to third week. After having been fed 500,000 larvae per week, pasture-fed lambs showed no diarrhoea but developed resistance to reinfection. Alfalfa-fed lambs developed diarrhoea. From these observations it appears that further study of host-parasite relations with particular reference to genetics and diet of the hosts are definitely warranted.

The nature of acquired immunity or resistance to nematode parasites is a field still in the developmental stage but it holds out definite possibilities for the future, if with sufficient understanding passive immunity can be accomplished. Serological reactions of previously infected hosts to the exudates of larvae with precipitations at the normal body openings was observed by Taliaferro some years ago. Tharson (1951) now reports that secretions and excretions of *Nippostrongylus muris* were injected intraperitoneally into rats and 4 days later known numbers of larvae were fed. Only one-third as many larvae developed in immunized animals as in controls. If similar methods could be further developed with other parasites it might be worth while.

The field of veterinary anthelmintics has developed rapidly and for the most part there are sound remedies for nearly all of our helminths of domestic animals. Phenothiazine probably did more to reduce the helminth parasites of domestic animals than all other drugs combined. Easy of use and high tolerance by the hosts are major factors. Phenothiazine not only reduces the parasitism of hosts when given in heavy doses, but can be used in small daily doses. Thus Cauthen (1951) reports 1 gm. phenothiazine daily to yearlings prevented 99% of the ova developing in the faeces, thus tending to clean up a pasture. Experimentally 1:40,000 mixed in manure prevents 90% of the larvae developing.

Levine (1951) has found that nicotine sulphate is one of the most effective means of killing the horse strongyle larvae in manure. A concentration 38,100,000 molar was lethal.

The most recent phase of helminthological development has come to deal with the actual physiology of the parasites themselves. This is a relatively recent field and as yet has provided little in the way of economic rewards for the applied science. Nevertheless, it is definitely a field to be reckoned with and one which eventually may be much more rewarding in the way of therapy than any of our more empirical work, which is presently being applied.

Most of our helminths have a primary and major carbohydrate metabolism. The nemtic parasites of domestic animals so far studied show 8-40% glycogen content by dry weight. None of the helminths are known to synthesize sugars. They all depend on their hosts for carbohydrates. These are acted upon by worm's amylase to break them down to glucose which is in turn synthesized to glycogen through the use of adenylic acid and glucose 1 phosphate from the cori ester.

Those worms living in an anaerobic medium utilize the intramolecular oxygen to gain energy, breaking the glycogen down to various fatty acids including valeric, lactic, acetic and others. Evidence of CO₂ as a product of metabolism is lacking.

A few forms living in oxygen-rich surroundings such as blood suckers, *Trichinella*, and filariids of the blood stream have been found to have an aerobic metabolism. In *Litomosoides* Bueding (1949) found the dismutation of 2 moles of pyruvate to one mole of lactate, one mole of acetate and one mole of CO₂.

Organisms with a marked aerobic metabolism show inhibited respiration in the presence of cyanine dyes which supposedly act on iron-porphorin enzymes. Highly specific oxidative enzymes are present. With sufficient knowledge, drugs may be developed which will act upon the parasite's enzymes without injury to the host. This is the great hope and great reward looked for in the study of nemtic physiology, with particular reference to carbohydrate metabolism. The drugs fuadin and heterazan essentially inhibit carbohydrate metabolism according to Bueding.

Lipids and proteins are also very important in the physiology of animal parasites but much less is known of the requirements or metabolism. Apparently there is little synthesis of fatty acids and amino acid synthesis is limited so that modification of host diet might be found extremely practical.

Von Brand and Weinstein (1951) found *Trichinella* larvae used no lipids anaerobically but in an aerobic environment they used 21% of their total lipids in 24 hours.

Reproducing helminths require great amounts of lipids and proteins as well as glycogen. The zygote does not gain more food or energy until it hatches. When formed, it is literally packed with cell inclusions of all three types but oils and proteins apparently predominate. Embryology is apparently an aerobic event in most instances. Lipids are the most economic energy materials and in the case of nemtic ova highly unsaturated oils, i.e., linoleic and linolenic glycerids appear to predominate. Protein storage in the form of cell inclusions probably nucleic acids and phosphoproteins are the major factors in forming the new generation. The zygote contains all the materials necessary for the production of a 500-cell larva. As this organism develops, the stored cell inclusions disappear. Here, then, is another phase of physiology which will gain importance in the future.

Minor elements, growth factors (a heat labile lipid) P, Zn, particular materials necessary for the formation of nemtic enzymes or materials which will inhibit them may be expected to lead to new means of therapy.

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A STUDY OF VITAMIN-A AND β -CAROTENE LEVELS IN DOGS AFTER ORAL ADMINISTRATION OF VITAMIN A AND β -CAROTENE

BY

G. R. MURKIBHAVI,

Lecturer, Bombay Veterinary College.

G. A. DHOPESHWARKAR,

and

J. C. TRIVEDI,

Pharmacological Research Unit, Council of Scientific and Industrial Research.

U. K. SHETH,

Professor of Pharmacology, Seth G. S. Medical College, Bombay-12.

and

R. A. LEWIS,

Medical Officer, W. H. O., ex-Visiting Professor of Pharmacology.

It is well known that animals get their requirements for vitamin A either by direct intake of vitamin A itself or of its precursor carotene (or other carotenoids). The herbivorous animals derive their vitamin A indirectly mostly from the green plants containing large amounts of carotene, whereas the carnivorous animals obtain their vitamin A directly from the animal sources.

Dogs usually have a mixed diet of both vegetable and non-vegetable food, and they normally obtain their vitamin A from both the precursor, β -carotene, as well as from ready formed vitamin A derived from animal food. We report here a study upon dogs, on the effect of feeding vitamin A and β -carotene and the effect on the levels of vitamin A and carotene in the plasma.

Although there is still some difference of opinion about the site of conversion of carotene in the body, there is no question about the conversion of carotene to vitamin A when carotene is given orally. There has been a divergence of results however, and also a difference of opinion with regard to interpretation, about the metabolism of carotene given parenterally. Eaton, Matterson, Dekker, Helms and Jungheer (1951) showed that conversion to vitamin A took place, in calves, when carotene was dispersed in water miscible, surface-active agents and introduced directly into the body, Church B.C. MacVicar R., Bieri J. G., Backer F. H., and Pope L. S. (1954) and Kon *et al.* (1955) however failed to record a conversion, in calves, after direct introduction of carotene into the body. This careful study on the metabolism of carotene and vitamin A, given by mouth or vein, in oily solution or aqueous dispersion, to calves, rabbits and rats by Kon *et al.* (1955) showed that there was a rise of vitamin A in rabbits and rats although not in calves. It is noteworthy that carotenoids are said not to circulate normally in the blood of rabbits, rats and dogs, while they do normally, circulate in the blood of calves. We have restricted this study to the oral administration of vitamin A and β -carotene to dogs.

Experimental

Twelve apparently normal, healthy dogs of both sexes and of various ages (2 to 4 years) were selected. The mean body-weight of these dogs was 30 to 40 lb. A normal mixed diet consisting of cooked meat, milk and bread was given daily. Vitamin A capsules, containing each 33,000 i.u. vitamin A (Crook's laboratories) were used in a dose of five capsules, with total of 165,000 i.u./ dog. The fasting blood levels of vitamin A and carotene were recorded before the oral administration of either vitamin A or β -carotene. Vitamin A was given orally with 4 oz. whole milk, and the blood collected in oxalate phials 4 hours after. This was done for twelve dogs.

Twelve dogs were similarly given 50 mg. β -carotene orally. β -carotene Crystalline Synthetic preparation, 20% suspension in ground-nut oil from Hoffman La Roche & Co. was used. Four oz. whole milk were then given to facilitate the absorption of the carotene. Specimens of blood were withdrawn after 4 hours and estimations of the vitamin A and β -carotene in the plasma were made. The dogs under experiment did not receive any food during the period of four hours following administration of the vitamin A or β -carotene. The estimation of vitamin A and β -carotene levels in the plasma was done by the method described by Bessey, Lowry, Brock and Lopez (1946), but using cyclohexane instead of kerosene-xylene mixture, to extract both Vitamin A and carotene.

TABLE I
Plasma Vitamin A and β -carotene levels in dogs after oral administration of vitamin A (165,000 i.u. (93.3 mg.))

Serial No. of Dog	Vitamin level (i.u./100 ml. plasma)			Carotene level (Ug/100 ml. plasma)		
	Initial	Final	Increase	Initial	Final	Increase
1	150	250	100	Nil	Nil	Nil
2	43	230	187	"	"	"
3	66	230	164	"	"	"
4	53	325	272	"	"	"
5	56	425	369	"	"	"
6	67	337	270	"	"	"
7	152	354	202	"	"	"
8	250	480	230	"	"	"
9	80	183	103	"	"	"
10	215	372	157	"	"	"
11	140	390	250	"	"	"
12	196	458	257	"	"	"
Mean	122.3	335.8	210	Nil	Nil	Nil
Standard deviation	+ 68.19	—	+ 80	0	0	0
	—	—	—			

TABLE II
Plasma Vitamin A and β -Carotene levels in Dogs after oral administration of β -carotene (50 mg.)

Serial No. of Dog	Vitamin level (i.u./100 ml. plasma)			Carotene level mg. (Ug/100 ml. plasma)		
	Initial	Final	Increase	Initial	Final	Increase
1	103	236	133	Nil	Nil	Nil
2	111	367	256	"	"	"
3	123	280	107	"	"	"
4	88	100	17	"	"	"
5	100	145	45	"	"	"
6	56	90	34	"	"	"
7	57	167	110	"	"	"
8	92	175	83	"	"	"
9	86	140	54	"	"	"
10	77	136	59	"	"	"
11	132	186	54	"	"	"
12	120	180	60	"	"	"
Mean	95	179.3	84.3	0	0	0
Standard Deviation	+ 25	—	+ 43	0	0	0
	—	—	—			

Results

Tables No. I and II show that oral administration of vitamin A and β -carotene caused a rise in the level of vitamin A in the plasma but there was no measurable appearance of carotene in the blood. There had been a pronounced variation in the initial vitamin A levels, but a definite rise is recorded after giving vitamin A and also β -carotene by mouth in all instances. It is noteworthy that after oral administration of β -carotene there was no appearance of carotene in the plasma. 99.3 mg. of vitamin A (165000 i.u.) produced a mean rise of 210 i.u. in the vitamin A level. β -carotene when given in doses of 50 mg. (83000 i.u.) orally, produced an average rise of 84.3 i.u. in the vitamin A level, per 100 ml. There was thus a positive rise in the vitamin A level after the oral doses of both vitamin A and β carotene.

Summary

Doses of 99.3 mg. (165000 i.u.) of vitamin A and 50 mg. (83000 i.u.) β -carotene were administered orally in two series of 12 dogs each.

Initial blood levels of vitamin A and carotene were determined in all dogs and this was repeated 4 hours after the oral administration of vitamin A and β -carotene.

No carotenoids were detected either before or after the oral administration of β carotene in the plasma of dogs.

A rise in the blood levels of vitamin A was observed four hours after the oral administration of vitamin A as well as after β -carotene.

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THE LABORATORY DIAGNOSIS OF CONTAGIOUS CAPRINE PLEURO-PNEUMONIA

BY

S. L. MANJREKAR, Ph.D. (Bact.),
Assistant Professor of Bacteriology,

P. R. DHAKA, B.Sc., (Vet.),
Lecturer in Bacteriology,
and

V. B. KULKARNI, B.Sc., (Vet.)
Research Assistant, Bombay Veterinary College.

Introduction

It has now been well established that the disease Contagious Caprine Pleuro-pneumonia, caused by '*Borrelomyces peripneumoniae capri* (Longley)'—an organism of the Pleuro-pneumonia group—occurs in certain parts of the State of Bombay, as well as in some other States in India.

The disease has, so far been studied in all its aspects, viz. the epizootiology, the symptomatology, the etiology, the post-mortem changes, both gross and microscopic and the curative and the prophylactic treatment. However a review of the available literature on this subject reveals that probably no work has been carried out to develop a suitable method for its exact diagnosis in the laboratory. In the field, the lesions which are exclusively confined to thoracic cavity, such as the development of lobar or lobular pneumonia accompanied usually by marked pleuritis with a rapidly clotting exudate and the marbling of pneumonic areas with variegation of the affected lobules are diagnostic of the disease. But these clinical and post-mortem findings have to be confirmed by the laboratory diagnosis.

The only test, besides the cultural isolation of the organism, that is so far available for confirming the disease in the laboratory involves the transmission of the disease in the naturally susceptible host—the goat and it is carried out by inoculating the suspension of the suspected lung material, which results in the death of the animal. Besides being very costly and laborious, the test is not cent percent accurate.

Review of the Literature

A reference to literature on a similar disease, viz. Contagious bovine pleuropneumonia, a disease of cattle, caused by an organism of the same group, shows that the precipitation, agglutination and complement fixation tests have been tried as an aid to diagnosis, with varying degrees of success.

Gaiger and Davies, report that normal Ox serum agglutinates suspension of contagious bovine pleuro-pneumonia organisms in dilutions of upto 1:80 and a titre of 1:100 or over should be regarded as positive and that of 1:400 be taken to denote an acute case.

Similarly, Shirlaw, and Iyer, (1948-49) studied the serological reactions of contagious bovine pleuro-pneumonia organism isolated from cases in Assam and compared them with those of the strains obtained from Australia and Africa with the object of determining simple and practical methods of field diagnosis and control by vaccinations. They came to the conclusion that no great reliance could be placed on the agglutination test and that a more positive and direct approach to diagnosis, at least in acute and recent cases could often be achieved by tapping the chest and submitting the pleural exudate so obtained to the laboratory for biological and cultural tests. They also suggested that the possibility of obtaining positive cultures from the blood should not be forgotten.

It would thus appear that the agglutination test with sera from the same species of animals, has little or no diagnostic value and that the only methods of diagnosis hitherto available are based on the epizootiology, the clinical symptomatology, the post-mortem lesions and the histopathological changes, along with the confirmation in the laboratory by direct transmission test in the susceptible host—the goat.

Methods and Materials

One of the authors (Manjrekar) worked on this disease for several years and in an attempt to develop some easy laboratory diagnostic methods, carried out Haemagglutination and Agglutination tests as per details given below:—

Haemagglutination test:—In these tests red blood cells from several species of animals such as (a) Bullock, (b) Goat, (c) Sheep (d) Poultry, (e) Rabbit and (f) Guinea-pig were tested against antigens listed below:—

1. Suspension of lung from a clinically affected goat.
2. Fourth generation culture (Virulent strain).
3. 239th generation culture. (Vaccine strain.)
4. Sixth generation culture (Freeze dried.) (Virulent strain.)
5. Pleuritic fluid from a clinically positive case.
6. Control:—Healthy goat lung piece suspension.

The antigens failed to produce any haemagglutination of the red blood cell suspensions.

Agglutination test:—Similarly, sera from the same species were collected for this test. All these animals were apparently healthy. The antigens used in these tests were as follows:—

1. Suspension of lung tissue from a clinically positive case.
2. Pleuritic exudate (fluid) from the same case.
3. 4th Generation culture (virulent strain.)
4. 6th generation culture (virulent strain—freeze dried.)
5. 239th generation culture (vaccine strain.)
6. *Control*:—Healthy goat lung piece suspension.

The technic for agglutination tests was similar to that done for the diagnosis of other diseases. Drayers tubes were used for all these tests.

All the antigen suspensions were adjusted to No. 2 Brown's opacity tubes. The control suspension from the healthy lung tissue was also adjusted to No. 2 Brown's Opacity tubes.

The total number of lung tissue and the pleuritic fluid samples collected for these tests were 14 in all.

The final dilutions in the tubes, after the additions of the antigens were as follows:—

1st trial:—1:10, 1:20, 1:40, 1:80, 1:160, 1:320, 1:640

2nd trial:—The dilutions were increased upto 1:1280 and 1:2560

In both these trials readings were taken 2 hours after placing the tubes in the water bath at 55°C, and again 24 hours after incubating them further at 37°C. The tables below give the titres obtained 2 and 24 hours after incubation at 55°C and 37°C respectively.

TABLE I

Readings of the titres after 2 hours incubation at 55°C.

S. No.	Antigen	Bullock	Sheep	Goat	Poultry	G. Pig	Rabbit
1	Lung suspension from a clinically positive case	1-80	1-10	1-20	Nil	Nil	Nil
2	Pleuritic fluid from the same case in live state	1-80	1-10	1-20	"	"	"
3	4th generation culture virulent strain	1-80	Nil	Nil	"	"	"
4	6th generation culture virulent strain, freeze dried	1-80	"	"	"	"	"
5	239th generation culture vaccine strain	Nil	"	"	"	"	"
6	<i>Control</i> . Healthy goat lung tissue suspension	1-80	"	"	"	"	"

TABLE II

Readings of the titres after 24 hours incubation at 37°C.

S. No.	Antigen	Bullock	Sheep	Goat	Poultry	G. Pig	Rabbit
1	Lung suspension from a clinically positive case	1:640	1:10	1:20	Nil	Nil	Nil
2	Pleuritic fluid from the same case in live state	1:640	1:10	1:40	"	"	"
3	4th generation culture a virulent strain	1:320	Nil	Nil	"	"	"
4	6th generation culture a virulent strain; freeze dried	1:320	"	"	"	"	"
5	239th generation culture a Vaccine strain	1:80	"	"	"	"	"
6	<i>Control</i> :—Healthy goat lung tissue suspension	1:80	1:10	1:20	"	"	"

None of the sera from the poultry, the guinea-pig and the rabbit agglutinated the organisms in the suspensions, even in titres of 1:10.

The readings recorded in Table No. 2 were taken up after 24 hours incubation at 37°C. To have further correct data similar tests were carried out on three more occasions, but in all these trials only Ox serum was tried. In these tests, the dilutions were increased and higher titres upto 2580 (1:2580) were obtained. (Manjrekar 1953-54).

The above findings were taken as the basis for further tests that were carried out in the Bombay Veterinary College Laboratory, and form a part of this present article.

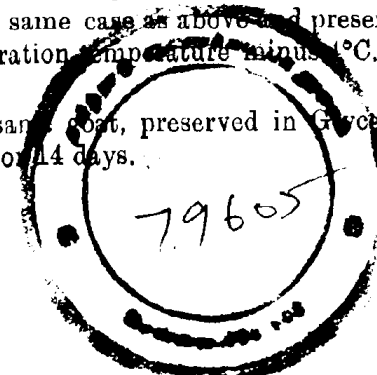
Fresh cultures of the Contagious caprine pleuro-pneumonia organism, viz. '*Borrelomyces peripneumoniae capri*', 6th generation virulent strain and the 170th generation vaccine strain, were obtained from late Shri P. R. Krishna Iyer, Research Officer, I.V.R.I.

The agglutination tests were carried out in the same manner as were done in the first three trials, and the following materials were used as the antigen:—

1. Lung suspension from an artificially infected goat and kept at refrigeration temperature minus 4°C. for 14 days.

2. Lung suspension from the same case as above and preserved in Glycerine saline and kept at refrigeration temperature minus 4°C. for 14 days.

3. Lung suspension from the same goat, preserved in Glycerine saline and kept at room temperature for 14 days.



4. Lung piece received from the Veterinary Officer, Palghar from a case suspected to have died of the disease C.C.P.P.

5. 6th Generation culture, virulent strain received from the I.V.R.I.

6. 1st generation culture isolated from an artificially infected case in the Bombay Veterinary College Laboratory.

7. Healthy lung tissue suspension as control.

8. Another control was kept with Normal saline.

Agglutination tests were carried out against the sera obtained from three species of animals *viz.* the bullock, the sheep and the goat. These donors of serum were apparently in good health. Serum also was collected from an artificially infected goat that had survived the infective dose. This goat was bled 3 weeks after the infective dose was given. Another serum sample was collected from an artificially infected goat, just prior to its death on the 4th day.

All the antigens were adjusted to Brown's opacity tubes Bo. 2. The following table shows the results after 24 hours incubation at 37°C.

Along with the above, sera from the Poultry, the Guineapig and the Rabbit were tried but none of them were found to agglutinate any of the antigens even in the lowest titre.

The piece of lung from an artificially infected goat used for the preparation of the antigen was collected immediately after destroying the goat when in a moribund state. The piece was preserved in the refrigerator in a sealed tube. Similarly two more pieces of the lung from the same goat, were preserved in glycerine saline; one of it was kept at room temperature and the other at the refrigerator temperature.

Discussion

It will thus be seen from the results of the Tables 1, 2, & 3 that the normal ox serum has got some agglutinins which are capable of positively causing agglutinations of all the antigens containing the organisms of the C.C.P.P. *vis.* *Borrelomyces peripneumoniae capri*.

The results in Table 1 are almost uniform with normal ox, sheep, and goat sera, in as much as the antigens were agglutinated upto a titre of 1:1280 in ox serum and 1:20 in sheep and goat sera. In no instances the higher dilutions gave any semblance of positive agglutinins with ox serum. However, all the antigens (including the healthy lung suspension) showed agglutinins in the titre of 1:80 and as such the agglutinations shown in titres upto 1:80 cannot be taken to be of diagnostic value. None of the antigens showed any suspicious or positive reaction in the sera from the poultry, the guineapig, and the rabbit.

Similarly the antigen from the 239th generation culture—a vaccine strain (Table 1) has not been agglutinated by any of the sera even in dilutions of 1:10. Probably the antigenic characteristic is not exhibited by the suspension during the short period of incubation of 2 hours, even though incubated at a higher temperature as 55°C. However, the same antigen was agglutinated by the normal ox serum in titres of 1:160 after 24 hours of incubation at 37°C. (Table 2.) This fact is once again corroborated by the readings with the antigen from the 170th generation culture—a vaccine strain (Table III.)

TABLE III

S. No.	Antigen	Bullock	Sheep	Goat	Artificially infected Goat serum 3 weeks after infection	Artificially infected Goat serum just before death 4th day
1	Lung suspension from an artificially infected goat. Lung tissue kept at refrigeration temperature.	1-1280	1-20	1-20	1-320	1-80
2	Lung suspension from an artificially infected goat. The tissue was preserved in glycerine saline and kept at refrigeration temperature.	1-640	Nil	Nil	Nil	Nil
3	Lung suspension from the same goat. The tissue was preserved in glycerine saline but kept at the room temp.	1-160	Nil	1-20	"	"
4	Lung suspension from tissue sent by the V.O. Palghar from a goat suspected to have died of C. C. P. P.	Nil	Nil	Nil	"	"
5	6th Generation culture-Vaccine strain from I. V. R. I.	1-1280	1-20	1-20	1-320	1-40
6	170th Generation culture-Vaccine strain from I.V.R.I.	1-160	1-10	1-20	1-80	Nil
7	1st generation culture isolated from a goat artificially infected in the Lab., B.V.C.	1-1280	1-10	1-10	1-640	1-20
8	Control. Healthy lung tissue suspension.	1-80	1-20	1-20	1-20	Nil
9	2nd Control. Normal saline.	Nil	Nil	Nil	Nil	Nil

The agglutination reaction noticed with the ox serum was always constant and cannot be explained, but the authors feel that the normal serum somehow has got definite agglutinins sufficient to be utilised for

the test and which definitely react against the Contagious caprine pleuropneumonia organisms *Borrelomyces peripneumonia capri*.

Lung tissue received from the field, through the Veterinary Officer, Palghar, which was preserved in glycerine saline, proved negative even in titres as low as 1:10 against the normal ox serum also, indicating that the case was not one positive for C.C.P.P.

Since the healthy tissue suspension also gives agglutination titres upto 1:80 anything upto that titre cannot be taken as diagnostic. But in any case the titre is never higher than 1:80 in cases when the antigen used is not from an affected positive case or the pure cultures of organisms of contagious caprine pleuropneumonia.

Sera collected from the Poultry, the Guinea-pig and the Rabbit showed no evidence of the presence of agglutinins at any time in any of the titres with the antigens used.

The test was also carried out by the "Plate method" in an attempt to see if quick agglutination method could be employed. The only trial carried out did not prove satisfactory and gave negative results. These results were quite contrary to those obtained by Priestley (cited by Gaiger and Davies 4th Edition). Probably the technique followed by the authors was not correct as the cross reference was not available when these tests were carried out.

Conclusion:—The disease Contagious caprine pleuropneumonia can be diagnosed in the field by its clinical and post-mortem manifestations, but the difficulty comes when the material from suspected cases is sent to the laboratory for confirmation of the field diagnosis. The isolation of the organism '*Borrelomyces peripneumoniae capri*' is not very easily achieved and many times it is likely to give erroneous results. Direct transmission of the disease in susceptible goats by the inoculation of suspensions of material from a case of the disease containing the organisms of the disease in a viable form is the only reliable method, so far available for the diagnosis of the disease in the laboratory. This method is laborious, time consuming and costly.

It has been shown that the bovine serum will agglutinate to a very high titre suspension of lung tissue from positive cases of the disease, as well as suspension of virulent organisms in cultures, which can be easily employed for purposes of diagnosis of the disease.

Summary

1. The literature on Contagious caprine pleuro-pneumonia from the diagnostic point of view is reviewed.

2. Serological test with sera from various apparently healthy animals of different species, such as the Ox, the Sheep the Goat, the Poultry, the Guinea-pig and the Rabbit were tried and their results are recorded.

3. It has been observed that the normal ox serum agglutinates suspensions of virulent cultures of the organisms to a titre which can be taken as diagnostic. Such positive titres are not obtained with sera from other species of animals such as sheep, goats, rabbits, guinea-pigs and poultry.

4. Normal ox serum in dilutions of 1:160 may be taken to denote a positive reaction.

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2. The Director of Veterinary Services, Bombay State, Poona.
3. The Principal, Bombay Veterinary College.
4. The Superintendent and the Assistant Superintendent, Virus Vaccines, Bombay.

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ANTHRAX SPORE VACCINATION BY THE SUBCUTANEOUS METHOD UNDER THE TAIL

By

K. ANANTHAPADMANABHAN, G.M.V.C.,
Veterinary Investigation Officer, (Sheep & Goats),
Ranipet, Madras State.

Introduction:—The use of Anthrax spore vaccine for protecting the sheep and goats has been a subject of much controversy. This vaccine if injected subcutaneously in the region of the neck in the usual dose of 1 c.c. causes severe cellulitis in a certain percentage of vaccinated animals and more particularly in goats. In some places mortality had also occurred among the vaccinated animals. The local reaction observed, sometimes is as big as a coconut, oedematous in nature, and extends over the whole of neck and also down the shoulders. In such cases, these animals are unable to move the neck freely. They carry it towards one side and sometimes the animal dies. When cut into, the local reaction presents the appearance of a gelatinous infiltration and a straw coloured fluid oozes out. It may be mentioned here that a similar type of reaction is noticed in guinea-pigs also if a virulent Anthrax culture is injected subcutaneously.

Such a severe reaction is not noticed in cattle when the same vaccine is given subcutaneously in the neck. The reasons are not quite clear. Some believe it is due to some toxic factors present in the bacteria and also to the type of media used for the preparation of the culture. Again it is believed that the site of injection had something to do with this kind of reaction and also the species of animals vaccinated.

In order to avoid the local reaction, injection of the vaccine after dilution with normal saline was tried to find out if such a dilution would be beneficial. The results by this method were also not successful. Experiments were therefore conducted, and it was found that the injection of the vaccine by the intradermal route in the caudal fold in a dose of 0.5 c.c. was quite successful and produced no untoward local reaction excepting a small nodular swelling at the site of injection. Therefore such a method of vaccination was strictly advocated and carried out.

During the course of my tours of investigation, it was observed that for mass vaccination of sheep and goats against Anthrax, intradermal injection in the caudal fold was not a practical procedure and that in most of the places where the injection was done, it was only subcutaneous under the tail and yet nothing untoward had happened.

Anthrax Spore Vaccination

By

K. ANANTHAPADMANABHAN.



Showing Subcutaneous injection under the tail.

Congenital Frontal Cyst in a Kid

By

M. WALIULLAH, B.V.Sc.



Before the operation.



After the operation.

[To face page 32]



Prof. R. M. KALAPESI,

whose sad demise we recorded in our September '57 issue.

A more detailed account is appearing in this issue.

This chance discovery made me conduct more than 500 vaccinations in the field by the subcutaneous method under the tail without any ill-effect. In order to confirm this fact still further, a systematic experiment was undertaken at the laboratory level. The spore vaccine manufactured at the Institute of Veterinary Preventive Medicine, Ranipet, was given subcutaneously under the tail in goats and not in sheep, as the former were noticed to be more prone to local reaction, and the type of reaction was studied in detail.

Experiment

Eleven goats were used for the above experiment. Their age varied from one and half to two years and their weights ranged from 65 to 88 lbs. On 17-1-57 all these goats were injected subcutaneously under the tail 1 c. c. of the Anthrax spore vaccine. Photo No. 1 shows the method of injection in the field. Subsequent to the injection, temperature was recorded in all these animals, both morning and evening and detailed observations of day to day local reaction were noted down. It was observed that during the course of the whole period the animals were quite normal in health, did not show any systemic disturbance and were feeding quite well. Among the eleven goats vaccinated only 4 showed a little severe local reaction in the form of a diffused oedematous swelling painful to the touch. The swelling was as big as a marble and about half an inch in diameter. All the vaccinated animals showed slight oedema at the site of injection from the very next day and this subsided within 5 or 6 days. Among the four animals that showed a little severe local reaction, the swelling subsided within one week. No complications developed in any of the vaccinated animals.

Conclusions

The subcutaneous injection of Anthrax spore vaccine under the tail of goats could be advocated as no untoward reaction, local or general is noticed.

2. This method of vaccination is more practicable under field conditions to carry out mass vaccination in sheep and goats against the disease.

3. For the subcutaneous injection of Anthrax spore vaccine, the under surface of the tail seems to be more suitable than the neck region, where the local reaction was noticed to be severe.

Clinical Article

CONGENITAL FRONTAL CYST IN A KID

By

M. WALIULLAH, B.V.Sc.,
Pathargatti - Hyderabad (Dec.)

On 26-8-1956 evening a two-day-old kid was brought to the Hospital with a congenital frontal cyst. The mother gave birth to twins. The co-twin was a freak, with fore-limbs on the back, and it died no sooner it was born. The present one was examined by me in the Hospital.

Congenital Cyst:—The cyst was pedunculated abutting on the frontal region extending upto the right orbit. I was unable to palpate whether the frontal bone was completely formed, as the cyst was tense with fluid. The cyst was about the size of an apple, and kid was unable to lift the head properly. The kid was active, suckling the mother with manual assistance. The temperature was 104.4°F and the pulse frequent. The heart beat and respirations were normal. To facilitate palpation it was necessary to tap the fluid. About 10 cc. of the fluid was tapped out, and it was collected into a flask and sent to the laboratory for examination. In appearance it was a sero sanguineous fluid. Laboratory findings revealed that the fluid was not the cerebrospinal fluid and that it was free from any organism. A cartilaginous ring was felt at the base of the cyst, which gave one to surmise that the frontal bone was still under ossification. By pressing at the centre of the cyst no abnormal movements were noticed. 10 cc. Calcium boro-gluconate (25%) was given I/V. Internally iodides with saline were given.

Next day the kid was brought with the same tenseness of the cyst. It had become necessary to operate.

Operation:—The part was shaved and sterilized with Tr. iodine. 2 cc. of planocaine was injected S/C around the base of the cyst. With all aseptic precautions the cyst was opened by making a transverse incision about 2" in length, and the fluid was drained and the cavity was given a thorough normal saline wash. The over hanging skin portion was cut down to required length. The underlying connective and adipose tissues were removed with great care. Four lacs of crystalline penicillin

solution was injected into the area. The lips of the wound were sutured by interrupted sutures giving minimum pressure on the brain. A Tr. benozoin swab was plugged. After operation the kid was found slightly dull.

Subsequently the following treatment was adopted as tabulated below date-wise:—

Date	Observations	Treatment	Remarks
27-8-56	Temp: 108°F, Pulse frequent, respirations normal, bowels clear: Patient dull after operation.	Seclophen 4 lacs I/M, C. B. G. 10 cc Stimulant 3 drachms	
28-8-56	T: 102.6°F, Bowels clear, respiration and pulse normal, Conjunctiva and M.M., pale unable to stand, constant peculiar movements of the lips, slightly anaemic, appetite better.	C.B.G. 10 cc I/V B. Complex ½ cc. I/M, wound dressing with Terramycin ointment, Easton's syrup one drachm, Aqua Qs.	Poor in Condition
29-8-56	T: 102°F Pulse, and respiration normal, bowels constipated No lip movements.	C. B. G. 20 cc., I/V. B. Complex ½ cc I/M. Mist. Carminative 3 drachms,	
30-8-56	T: 102.6°F better appetite, bowels clear, pulse and respiration normal.	As above.	A little active.
31-8-56	T: 103°F bowels clear, appetite fair, pulse and respirations normal able to stand and lift the neck.	Repeat above.	No abnormality noted, ease towards improvement.
1-9-56	As above		
2-9-56	T: 103°F condition improving, full appetite: able to walk and stand.	Repeat, Sutures removed.	Do
3-9-56	Cartilagenous edges were encroaching towards each other.	Penicillin ointment dressing, repeat injections.	Better.
4th to 10th	Temp., respirations and pulse remained normal throughout. From 6th the kid become active and general condition was good.	C.B.G. 15 cc I/V daily B. complex I/M alternatively Mist. Tonic 3 drachms daily.	Do
21-9-56	The kid was brought to the Hospital. I was so glad to find that most of the part was ossified. The kid was quite healthy.	C.B.G. 15 cc I/V Carminative mixture 3 drachms.	Cured.

Abstracts

Routine Investigations into Mycotic Abortion:—By P. K. C. AUSTWICK and J. A. J. VENN, *The Veterinary Record*, May 1957, Vol. 69, No. 18, P. 488-491.

Theobald Smith first called attention to the mycotic abortion in bovines in 1920. Since then this condition has been reported from various countries. In 1955, two routine surveys were undertaken independently at the Bristol Veterinary Investigation Centre and at the Veterinary Laboratory, Weybridge in order to assess the frequency of this condition in the United Kingdom. Macroscopical and microscopical examinations of the stomach content, amniotic fluid, necrotic cotyledons and skin lesions of the aborted fetuses were carried out for detecting the presence of hyphae. 2% malt extract agar (pH 5.5) was used as the isolation medium. 20 units of Penicillin and 40 units of Streptomycin per ml, were added to the medium at Weybridge Laboratory to inhibit the bacterial growth. The plates were examined after 24 and 48 hours and at intervals upto one week, when only those plates showing developing colonies were retained. 601 fetuses and 52 placentae were examined by these methods and 41 cases of mycotic abortion diagnosed (average 6.2 percent). The fungi most frequently isolated were *Aspergillus fumigatus* (29 cases) and *Absidia ramosa* (4 cases). The first records of a yeast (*Candida tropicalis*) and a basidiomycete (*Polystictus versicolor*?) from this type of abortion are reported. Placental lesions of a characteristic type and discrete and diffuse foetal skin lesions were all observed on single occasions. The frequency of the condition in relation to other known causes of abortion suggests that it is of considerable economic importance.

A. MUKERJI.

Enterotoxaemia of Sheep: Experimental Reproduction of the disease:—BULLEN, J. J. and SCARISBRICK, R (1957). *J. Path. Bact.* LXXIII, (2), 495-509.

(Author's Summary reproduced).

1. Normal sheep developed typical acute enterotoxaemia when cultures of *Cl. welchii* type D were introduced into the intestine after large feeds of wheat, oats or lucerne.

2. Over-eating was found to play an essential part in the development of the experimental disease. Introduction of the culture into the intestine without over-eating appeared to be harmless.

3. Over-eating and the successful reproduction of the disease was associated with the presence in the intestine of undigested or partly digested food. In this environment *Cl. welchii* grew extremely rapidly.

The growth of the organism in the absence of this undigested food was comparatively poor.

4. In every case of the experimental disease high concentrations of epsilon toxin were present in the intestine for several hours. Low concentrations of toxin in the intestine, even for long period, were harmless. High concentrations of toxin were also harmless if present only for very short periods.

5. Over-eating alone frequently gave rise to ruminal acidosis which was sometimes fatal. This syndrome was distinguished from experimental enterotoxaemia.

6. Enterotoxaemia could not be reproduced in immune animals even though the intestine was exposed to high concentrations of epsilon toxin for very long periods.

A. MUKERJI.

Laboratory trials with an Avianised Rinderpest Vaccine:—S. E. PIERCY and M. A. WITCOMB (1957). *B.V.J.* 9, 353-366.

In East Africa for Rinderpest immunisation, Kabete Attenuated goat virus is used for indigenous zebu and low-grade European/Zebu cattle and Lapinised virus for pure-bred and high-grade exotic breeds. The latter sometimes causes severe reactions in certain hyper-susceptible cattle. Though Lapinised virus is said to confer immunity for not less than two years some of its disadvantages are its high cost of production, its fragile nature, lack of thermal response in vaccinated animals, (thus precluding a ready assessment of its potency and viability) and outbreaks of pasteurellosis and coccidiosis among rabbits jeopardising vaccine production.

Successful attenuation of the Rinderpest virus by adaptation to embryonated eggs was reported by the Gross Isle, Chinese and Japanese workers. This vaccine was found to be too virulent in some cases for certain types of hyper-susceptible cattle, necessitating the use of avianised-lapinised virus.

In East Africa certain field trials with Gross Isle strain gave moderately good results. Conclusions of F.A.O. Nairobi Rinderpest Meeting were optimistic about the future of avianised virus for mass production.

The authors conducted certain Laboratory experiments with the freeze dried avianised virus vaccine produced by them, using the Nakamura strain obtained from Tokyo, which was in its 237th yolk passage at the time of receipt. Medium grade European/Zebu type cross-bred steers were used in the experiments. At least two animals

per dilution were used in titration experiments. A two degree rise in the morning temperature was considered a positive thermal response. The animals were challenged 2-3 weeks after inoculation with either at least 1000 M.I.D's of Kabete 'O' virus or a field dose of K. A. G. Virus.

Their more important findings are (1) 1 Gramme of dried whole egg vaccine gave satisfactory immunity upto a titre of 10^{-6} , (2) the potency of the vaccine with an original immunising titre of 10^{-5} dropped after reconstitution by 1 log after six hours at 30°C . or after one hour at 40°C . and (3) the dried vaccine of the same immunising titre (10^{-5}) showed loss of potency by 1 log when stored at 30°C . for 7 days and by $\frac{1}{2}$ log after 9 months at -25°C .

In their discussion of the main findings they observe that even taking 10^{-4} as the complete immunising point and providing an ample field dose of 100 M.I.D's, 10,000 field doses of vaccine could be obtained from about 12 eggs. Production would be simple, effective and more economical (less than 1/10 cost of lapinised virus vaccine) and easily capable of mass production. As regards the keeping quality of reconstituted vaccine there is ample time for inoculation at the common shade temperature (about 30°C). During hot conditions of the season (about 40°C) vaccine should be injected into the animal within an hour of reconstitution, or the vaccine may be kept cooler by immersing the container in water. Satisfactory keeping qualities of the vaccine may be due to the buffering and colloidal constituents of the egg.

In the authors' experiments, 80% of the animals immunised with 1/10 of the recommended field dose of vaccine showed significant thermal response thereby indicating that avianised virus is capable of conferring immunity for at least as long a period as lapinised virus.

Another revealing point of their experiments was the retention of antigenicity by the virus even on prolonged cultivation in yolk sac (it was in its 238th yolk passage) though some workers had reported too great an attenuation to evoke immunity at a much earlier passage. Either the latter had lost the virus or the Nakamura strain is peculiar one or has become fixed in characteristics. Experiments on the effect of vaccine on high grade and pure-bred European types of cattle and duration of immunity and field trials of vaccine require to be studied further.

M. S. J.

Recent Observations on Rinderpest Immunisation and Vaccines in Northern Nigeria: W. PLOWRIGHT (1947). *B. V. J.* 9, 385-399.

In Nigeria caprinised virus cannot be used with equanimity for fear of severe reactions (1) for local (Fulani) Zebus below 12-18 months,

(2) for animals showing sub-clinical infections like Trypanosomiasis (3) for those in transit (4) during adverse environmental conditions and (5) in areas free from Rinderpest.

Further attenuation of the virus is not envisaged. It may be regarded as 'fixed' in virulence.

The author's observations on the pathogenicity of caprinised virus from records of 145 cattle (aged $1\frac{1}{2}$ - $3\frac{1}{2}$ years) used in titration of vaccine batches were:—(1) The overall range of duration of temperature reaction was 2-10 days. (2) Nearly 70% of the animals showed diarrhoea. The onset of diarrhoea was between the 3rd and 7th day after the pyrexia and this lasted from 4-8 days. (3) Taking into consideration only those deaths up to one month after inoculation the overall mortality was 13%. The third week was the most important. (4) Younger and poorly grown animals showed more pronounced lesions. Mouth lesions were not seen. Emphysema of the anterior lobes of the lung was frequent.

In the experiments with lyophilised lapinised virus vaccine, the following are the more important observations. The virus which was in its 835th rabbit passage when injected into rabbits as 10^{-2} suspension of the freshly infected tissue produced consistent reaction at 24 hours. In all reactors cultural examination for *Salmonella* was made due to similarity of lesions in both the infections. The tissues (the spleen, the mesenteric glands and defibrinated blood) were harvested on the second day after inoculation. On an average each rabbit yielded 1000 doses of vaccine. Where experimental rabbits showed infection when inoculated with 1/200,000 dilution of vaccine, the batches of vaccine produced were satisfactory. There was no fall in the potency of vaccine after 6-8 months storage at -20°C .

In the titration experiments in cattle, about 800 rabbit Mids produced consistent immunisation. Mid for cattle was more than six Rabbit M.I.D's but less than ten. Estimates of 1D-50 were according to the method of Reed and Muench.

In the field experiments in one herd of Zebu-Friesian Cattle (20 animals) and in two herds of Fulani owned Zebus (143 animals) serviceable herd immunity with 2 mg. of high potent vaccine was recorded. The author observes that calves could be immunised with lapinised virus in the face of outbreaks.

As regards thermal response there was a wide distribution in reaction periods. Calves showed more frequently earlier rise of temperature lasting longer than in old animals. No other clinical sign was observed.

In the discussion the author observes that since rabbits furnish a host system of uniform high susceptibility these only can be used for accurate titration of vaccine. Lapinised virus can be used to immunise Fulani Zebus, but due to the fragile nature of the same it should be used within thirty minutes of reconstitution in the chilled and buffered diluent. Since less than 30 per cent of adult cattle show detectable reaction to ensure security in the efficacy of vaccination it is better to use 10 mg. of dried vaccine as the dose instead of the required 2 mg.

The author's preliminary work with egg adapted strain obtained from Egypt has given encouraging results as regards 'indicator type' of thermal response.

M. S. J.

News and Views

Mr. P. Seneviratna B.V.Sc. (Madras) has been awarded the Ph.D. degree in the faculty of Science of the London University. He has obtained this degree in the minimum period of two years. He is a member of the staff of the Ceylon University, and is attached to the Faculty of Agriculture and Veterinary Science. Mr. Seneviratna's thesis is entitled 'Studies of *Anafilaroides rostratus* Gerichter, 1949 in cats, with observations on allied genera of nematodes'.

* * * *

Mr. A. Ramamohana Rao, B.V.Sc. (Madras) has received a research fellowship from the University of Illinois (U.S.A.) He is now working in the department of Dairy Science under Dr. G. W. Salesbury. Mr. Rao had a brilliant academic career while in Madras. He had the distinction of being awarded four gold medals in various subjects in 1956. Let us hope he will cover himself with even greater glory before he returns to India.

* * * *

U. S. S. R. Agricultural Delegation:—A four member delegation from U. S. S. R. after going round this country, said at New Delhi that the methods of Agricultural development in India were in keeping with the country's peculiarities and expressed the view that these would show good results. They seem to have had an eye for the genius of the people, their habits and customs, environmental factors, etc. That is as it should be.

* * * *

Australia's "wonder" horse, the three-year-old colt, Tulloch, may race in England next year, according to the *Melbourne Herald*. Mr. E.A. Haley, the owner, is considering this move and there is also an offer to buy the horse with the same object in view. Tulloch is

unbeaten in six starts this season including two Derbys. As a two-year-old he had seven firsts and six seconds in 13 races. So far Tulloch has won over 36,640 Sterling. *The Hindu*, 7-11-57.

* * * *

Nomination has been secured for Aly Khan's Rose Royale II to be mated with Ribot, the Italian wonder horse, when she retires to stud next year (writes our London correspondent). *The Hindu*, 7-11-57.

* * * *

The I.C.I. Publications:—We happened to see a pamphlet of five or six pages on "Notes on the common diseases of livestock and their treatment" issued by the Imperial Chemical Industries (India) Private, Ltd. The new innovation about it is that it has been issued in as many as thirteen languages, so as to be able to reach the rural folk.

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.]

MIXED FARMING - II

(ANIMAL HUSBANDRY)

By

T. VINAYAKA MUDALIAR, G.M.V.C.,

Retired Livestock Development Officer, Government of Madras.

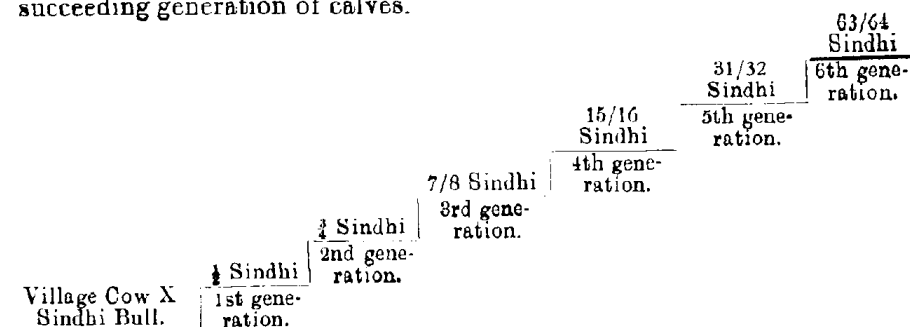
In my last article under the above heading, I tried to explain what *mixed farming* is and then dealt with its main branch, agriculture, indicating some of the approved lines on which improvement could be brought about. The next item of importance under mixed farming is Animal Husbandry. It is the main prop on which Indian agriculture rests. All tall talks of mechanisation of agriculture are the privilege of those who indulge in verbal pyrotechnics and do not sweat in the fields. Cattle and crops are inseparable in India and may continue to be so for many more years to come. They are so dovetailed that one will wither away without the help of the other. That is the underlying fact in *mixed farming*. Man who is the co-ordinating factor in this scheme of things has realised long ago that no improvement is possible in one without a corresponding improvement in the other. Hence he maintained the balance well till the recent past as could be seen from our literature. But soon came influences beyond his control—economic, social, political, religious and the like which swept him off his feet

and made him lose his sense of value of things. He allowed his cattle to deteriorate and with it came the deterioration of Agriculture. To-day you hear the slogan "Produce or Perish". It is a desperate call. Let us then be up and doing. Let first things come first. Take care of your cattle and the cattle will take care of you and your land. I am not going to load you with statistics regarding the numerical strength of our livestock, their poor performance, etc., as compared to livestock in other countries. You have heard them often and I take it you know them all. Time for talk is over, let us get down to some work with proper understanding.

How then are we to plan for the improvement of our livestock to bring them up to the level obtaining in more advanced countries? We need not now toil hard to find out methods and means. They are all there as scientific truths and as an open book to those who care to get benefitted by them. There are several methods of bringing about such an improvement. But our need of the hour is to bring about a mass improvement of the entire village herd. This could be done by grading them up to the required standard by the use of superior pure bred bulls of the breed of your choice to suit local conditions. It is the cheapest, quickest and the best way to bring about herd improvement. I dare say that is what is going on in your village under the several National Extension Schemes and at the newly established Artificial Insemination centres. To appreciate its worth fully and well, you must understand the underlying principle in 'grading-up' work. For you can undo at some stage or other all the good work done if you allow a non-descript scrub bull or for the matter of that, even a 'graded' bull to serve your graded heifers or cows. You must keep up strictly and faithfully to a pure-bred sire of the breed you have chosen, for not less than six or seven generations. Then you will see the wonderful transformation of the entire village herd within a period of twenty to twenty-five years. You can improve them either for work or for milk or for both as per your plan which you design in consultation with your Animal Husbandry experts. But mark you, there is absolutely no purpose in bringing into existence improved stock, if you are not going to feed them adequately on balanced rations, cultivate enough fodder for them and bestow some care in their day to day management. The following diagrammatic illustration may help you to understand easily how the improvement is brought about from generation to generation.

Let us suppose, that the village non-descript cows are mated to a pure-bred Sindhi bull or bulls. The following is the rate of improvement brought about from generation to generation. The fractional

figures represent the amount of Sindhi blood they acquire with each succeeding generation of calves.



So in about six generations the village stock reach the level of pure-blooded Sindhis. Instead of Sindhis you may grade up your cattle to any other breed. If you avoid the pitfalls indicated above the livestock improvement of your village is assured.

I. C. A. R.

Farm News Releases

Moulting in Hens:—Poultry farmers are advised that they should take advantage of the moulting period of hens to select superior layers and breeders from among the flock.

Early or slow moulters are poor layers as a rule. As such, these should not be used for further breeding. Birds which are poor in constitution or which tend to put on fat or porcupine-like feathers, should be culled out.

Birds can be helped to start laying early through proper feeding and management. They should be given four to five ounces each of a well-balanced mash; the quantity should be increased as the birds grow up for laying.

One or two per cent of shark-liver oil added to the mash has been found to be beneficial to the birds. Fresh greens and calcium grit and oyster shells should also be made available to the birds.—No. 302/57.

Cannibalism in Poultry:—Crowding of chicks or birds in small enclosures is a major cause of cannibalism in poultry birds.

Cannibalism, also known as feather-pecking, is a serious vice among chicks as much as among grown-up birds. The vice spreads quickly in large flocks, and if not checked in time, causes serious losses.

Apart from overcrowding of the birds, a lack of protein and calcium in the diet also makes chicks and birds peck at their neighbours. Once the vice enters the flock, hard work and patience on the part of the poultry-keeper will be required to overcome the same.

When there is cannibalism in your flock, first find out the cause for the same. If it is due to overcrowding, put the birds in larger enclosures. If it is due to a defective diet, feed them with a mash rich in protein or calcium.

If, in spite of these steps, the birds do not discontinue the habit, "debeaking" them will be only remedy. This is an operation by which the upper beak of each bird is shortened. It is necessary, however, that all birds are "debeaked."—No. 308/57.

MEMOIR

LATE PROFESSOR R. M. KALAPESI

AN APPRECIATION

(Contributed)

It is with deep regret that we have to report the sudden and sad demise of Professor R. M. Kalapesi due to heart failure on 7th May 1957 at 8-45 p.m. (G.M.T.) at Glasgow (U.K.).

Professor Rustom Manekji Kalapesi, G.B.V.C., P.G. (Edin.), born on 11th March 1909, graduated from the Bombay Veterinary College in 1930. To begin with, he served in the Bombay Corporation for about 2 years and in June 1932, he joined the Civil Veterinary Department, as an Inspector in the Bombay City and Harbour Veterinary Section. In 1938, he proceeded to Edinburgh for Post-Graduate Training in Veterinary Bacteriology. In 1946 he was deputed by the Bombay Government for special training in the production of Ranikhet Disease Vaccine to the Indian Veterinary Research Institute, Mukteshwar.

In August 1947, Shri Kalapesi was appointed Assistant Professor of Pathology of the Bombay Veterinary College and was promoted as Professor in October 1952. During his brief tenure as the Head of the Pathology Department, he worked hard for the improvement of the section and succeeded in making it one of the outstanding amongst the Veterinary Colleges of our country. By sheer dint of hard work, systematic planning and perseverance, Professor Kalapesi put his section on a very sound footing. He was keen on proceeding to Glasgow Veterinary College to acquaint himself with the modern technique,

recent advances and the present problems in the field of Veterinary Pathology. He contributed several papers, some of which were read at the various sessions of the Indian Science Congress and were published in some of the leading Scientific Journals. Those deserving special mention are: "Amyloidosis in domesticated animals in India," "Histo-pathological studies in Schistosomiasis in an Elephant", "Trichinosis in a Cat" and "Aspergillosis in a Peacock."

Professor Kalapesi possessed a charming personality and was endowed with impeccable manners. Though a strict disciplinarian, he was popular amongst his associates and students alike. He always worked for the betterment of his subordinates and granted them equal opportunities for advancement. He was held in high esteem by the leading Pathologists and Veterinarians in India.

Professor Emslie, Head of the Pathology Department, University of Glasgow, pays a glowing tribute to Professor Kalapesi in the following words:—

"Although I write primarily for myself, I am quite sure that I also voice the feelings of all the members of my staff when I say that it was a very real pleasure to have had Professor Kalapesi with us. By his modest and unassuming ways and through his friendly disposition, he endeared himself to all with whom he came into contact. You could not have selected a more acceptable ambassador. He was a "great little gentleman" and that is how I shall always think of him.

In more ways than one, Bombay Veterinary College has sustained a serious loss in which I, and all of us here, feel the deepest sympathy."

Professor Kalapesi had booked his return passage to India for 22nd July 1957, but the cruel hand of fate snatched him away from our midst, depriving his *alma mater* of an illustrious alumnus and an ardent worker.

We offer our heartfelt condolences to the bereaved family.
May his Soul rest in Peace!

Dr. D. S. LAUD, G.B.V.C.

As we go to press we have received the shocking news of the sudden demise of Dr. D. S. Laud, President of the Bombay Veterinary Medical Association of heart-attack on the night of 15th December 1957. We shall publish an account of his life and work, in our next issue.

In the meantime we offer our heartfelt condolences to the members of the bereaved family.

Silver Jubilee

OF

THE INSTITUTE OF VETERINARY PREVENTIVE MEDICINE MADRAS STATE

Ranipet in Madras State, situated in an odd corner, staged a celebration of great importance to the Veterinary profession on 27th October 1957. It was the Silver Jubilee of that famous Institute of Veterinary Preventive Medicine. A distinguished gathering was present.

The Chief Minister of Madras State, Sri K. Kamaraj inaugurated the celebrations and the Minister for Home Sri M. Baktavatsalam, presided. The celebrations were held in a specially erected 'pandal' decorated with flags and festoons. The Director of Animal Husbandry Department, Madras, Sri D. Pattabiraman in welcoming the Hon'ble Ministers spoke as follows:—

THE HON'BLE CHIEF MINISTER, MINISTER FOR AGRICULTURE,
LADIES AND GENTLEMEN,

It is a pleasure and privilege to extend to you all a very hearty welcome to the Silver Jubilee Celebrations of the Institute of Veterinary Preventive Medicine. We are very much indebted to the presence of the Hon'ble Ministers, as they have made it convenient to honour the occasion with their presence, in the midst of their heavy agenda of work, when both the State Legislative Bodies are in session. Nothing but a full appreciation of the good record of work that this Institute has been doing, could have secured their presence here this evening. It is a matter, Sir, that will go a long way to hearten us in our task.

Situated in an odd corner of this State, lacking all the glamour and publicity of a metropolitan city, this Institute has been serving a great national cause with a devotion that deserves the attention of both the public and the Government. We have placed on record, in the form of a Souvenir the history of this Institute ever since its inception, 25 years ago. That Souvenir is already in your hands and I shall not therefore cover the same field in great detail. But I shall try to give you a very short survey of its salient features.

Before this Institute came into existence in this Southern State, it was customary to get our needs of Sera and Vaccines for prevention of contagious diseases amongst cattle from the Indian Veterinary Research Institute at Mukteswar, situated at the foot of the Himalayas, in the State of Uttar Pradesh. The cost was prohibitive, transit was cumbersome and long, the time involved directly contributed to increased mortality and this State felt helpless to tide over these difficulties. That worst scourge of cattle, Rinderpest, rightly called the Cattle Plague, was sweeping this State in 1928-29, in one of its periodical waves and as many as 1,28,000 heads of cattle were carried away by this fell disease.

If computed in monetary value, the loss sustained by Rural India was something colossal. There was only one remedy for this and that was to manufacture the necessary sera and vaccines within the State itself. The then Government immediately decided to establish a Serum Institute at Madras and took steps to get the necessary personnel trained and equipment obtained. Thus this Institute came into existence in 1932 in the City of Madras under the modest appellation of the "Serum Institute" and got into production immediately. It did not take long for the Government to realise that it was cheaper, quicker and more effective to render necessary service to Rural India, during times of outbreaks of contagious diseases of cattle. The battle then begun against Rinderpest was ruthlessly pursued by the entire department and it is to the glory of the Animal Husbandry Department of Madras that it is the first State in India to have scored a victory over that fell disease. We have been free, Sir, from the disease for the last four years and God willing, we hope Sir, to be free from it for ever, if the Rinderpest Eradication Scheme of the Central Government proves a success. The Institute was not only able to meet the demands of this State but soon went to the rescue of adjacent States as well. I stop to ask you, Ladies and Gentlemen, if that is not a record which Madras as a whole can well be proud of?

Encouraged by the success of this one product against Rinderpest, the Institute took upon itself the manufacture of Sera and Vaccines for other diseases of cattle, sheep, goats and poultry. And to-day there are as many as 14 products put out of this Institute to combat various diseases of livestock side by side, continuous research is going on to improve on the existing methods.

There are three special Research Schemes sponsored by the Indian Council of Agricultural Research entrusted to this Institute. They are in progress. That gives an indication of the amount of confidence which the Institute commands in Scientific circles. The details of these schemes are to be found in the Souvenir. The Food and Agricultural Organisation of the United Nations thought it fit to supply a Freeze Drying Machine with accessories to this Institute and even send a Veterinary Expert to train the staff in handling the equipment and in the manufacture of products on modern lines. Thus it has been developing stage by stage into a first rate Institution and given the necessary funds, place and personnel, this Institute is bound to benefit the country at large and contribute much towards the development of Science.

Its present location cannot be considered to be ideal. From Madras, it had to be shifted to Coimbatore during war time, for safety and for prevention of any possible dislocation in its highly useful work. It was located there in the Agricultural College Estate as an emergency measure. War over, we had no place to go to, as the original building at Madras was disposed of to the Carnatic Mills. So by force of circumstances, we found this present building, which was once a Dehydration Factory during war time, available for our use. We are here since then and have made several additions and adjustments. With more increased work and with further developments, the day may not be far off when this Institute will have to move into a more central

place with better facilities for its work. It has been computed that a net savings of nearly 8 lacs of rupees accrued every year at the present moment by our producing the required products at this Institute itself. To this if we could add the cost of livestock saved from preventable diseases every year, the figures might well sound astronomical. That is in short the summary of work of this Institute which has been plodding on quite silently and without much attention either from the public or the Government and yet doing its allotted work with commendable zeal and enthusiasm.

Now Ladies and Gentlemen, it is my pleasant duty to request the Chief Minister to inaugurate the Conference and the Agricultural Minister to preside.

Sri K. Kamaraj, the Chief Minister, in inaugurating the celebrations expressed his satisfaction at the highly useful work the Institute has been doing. "The preventive work of the Animal Husbandry department" he continued "has benefitted the rural parts very much" and added "I feel proud of the fact that this Institute is helping the adjacent States with necessary Veterinary biologicals to such a great extent."

Sri M. Bhaktavatsalam, Minister for Home, who presided recounted in great detail the great part played by this Institute in the matter of eradication of Rinderpest from this state and elsewhere. After the usual vote of thanks, the visitors were taken round the Institute and its varied activities were explained.

THE TWELFTH MADRAS STATE VETERINARY CONFERENCE

The Twelfth Madras State Veterinary Conference was held at Ranipet on the 29th October '57 in conjunction with the Silver Jubilee Celebrations of the Institute of Veterinary Preventive Medicine and the Annual Departmental Officers' Conference. The conference met in the beautifully decorated Jubilee pandal. As many as eighty-eight delegates from all over the state attended the conference.

Sri D. Pattabiraman the President-elect and Sri K.N. Srinivasan, the Mayor of Madras who was to inaugurate the conference were received at the entrance to the Institute by the Chairman and members of the Reception Committee and by the President and the Secretary of the Madras Veterinary Association. The band of the Junior Certified School, Ranipet was in attendance. After conducting the distinguished guests to the dais, the proceedings commenced with prayer by Kumaris Subbulakshmi and Vasantha. Sri S. Vancheswara Iyer, Chairman of the Reception Committee in welcoming the delegates spoke as follows :—

THE WORSHIPFUL MAYOR OF MADRAS, LADIES AND GENTLEMEN,

I have great pleasure, as Chairman of the Reception Committee of the 12th Madras State Veterinary Conference, to extend to you all a warm welcome. I take this opportunity to thank you for responding to our invitation.

It is our good fortune to have in our midst Sri K. N. Srinivasan, B.A., B.L., Mayor of Madras to inaugurate our Conference. As the first citizen of the Metropolitan City, he has many responsible engagements to attend to every day and it is nothing but his full appreciation of the importance of Animal Husbandry work in our State that could have induced him to accede to our request and come so far away from Madras. We tender our grateful thanks to him.

We are meeting to-day along with a great event in the history of the Animal Husbandry Department of this State, an event which every member of the profession in our State should feel proud of. I am sure you were all present on Sunday at the inauguration of the Silver Jubilee celebrations of this Institute, one of the foremost in the field of production of veterinary biologicals in our country. The celebrations were inaugurated by no less a distinguished person than our revered Chief Minister. We, as members of the profession, deem it a great honour that he, in the midst of numerous other engagements, had agreed to be with us which no doubt was due to his keen and active interest in the activities of our Department.

We are also very fortunate that we have Sri D. Pattabiraman, our Director, to guide us wisely in our deliberations to-day. You all know the valuable contribution he has made to the development of livestock in our State. It is a fitting recognition of his services that he has been entrusted with the execution of the ambitious schemes included in the Second Five-Year Plan for the improvement of livestock in our State. We are grateful to him for consenting to preside over the Conference this year.

In passing, we should recall that the last State Conference was held in the year 1955 conjointly with the All-India Veterinary Conference at the time of the Golden Jubilee celebrations of the Madras Veterinary College, when representatives from the various State Associations were also present. Since then many important events have taken place in the development of veterinary profession in the State. The Pilot Project for the eradication of Rinderpest was pushed through with great success during the First Five-Year Plan. The All-India scheme based on the results of the pilot project for the total eradication of the disease from the country has been launched and is in progress in most of the States in the country. To cope up with the increased demand for the Rinderpest vaccine a number of centres for vaccine manufacture, of which this Institute is one, has been established in the country. Our State continues to make valuable contribution to the conduct of All-India Rinderpest Eradication Scheme, by supplying the required quantities of Rinderpest vaccine to the States of Andhra Pradesh, Bombay and Mysore. As regards the control of other major diseases like Haemorrhagic Septicæmia and Black Quarter, constant research is being carried out to improve the present vaccines so that strong and lasting immunity is conferred on the vaccinated cattle. The diseases like Brucellosis and Mastitis have also been receiving due attention and two schemes jointly financed by the Madras Government and the Indian Council of Agricultural Research have just commenced functioning at this Institute and at the Madras Veterinary College respectively. Other diseases of cattle and those affecting sheep

and goats and poultry are also receiving considerable attention. The ubiquitous Foot and Mouth Disease continues to cause considerable hardship to the ryots and with the rapid development of the livestock industry in our State, it becomes imperative that early steps are taken to tackle the problem of control of this disease by establishing a Foot and Mouth Disease Research Laboratory in the State.

Great strides have been made in the matter of Veterinary and Animal Husbandry education in our State. Our College one of the oldest and best in the country continues to maintain the high standard and traditions and many of the students of the College occupy responsible positions in the various States of our country and outside. Plans for the expansion of this great Institution have already been taken up and are in progress. At present, facilities for increased admission of students to the College have been instituted.

Considerable progress has been made in the extension of Veterinary aid in our State by the establishment of a number of Veterinary Dispensaries and Extension centres. Nevertheless, these still fall short of the standard fixed by the Royal Commission on Agriculture, i.e., one Veterinarian for every 25,000 head of cattle. However, it is hoped that as this is due to the present acute shortage of qualified personnel, with the increased output of our College, we will be able to extend this activity to cover every corner of our State.

Lastly, but no less important are our achievements in the field of livestock development in our State. The premier farm in our State—rather in South India, the Hosur Cattle Farm has been acclaimed as one of the best in the country by eminent veterinarians and scientists. This farm continues to contribute high quality pedigree animals for the development of livestock in various parts of our State. It is gratifying to note that a beginning has been made for the establishment of a livestock farm in each district by the opening of a cattle farm in Ramanathapuram district, and with the increased activities of the key village centres in our State, the development of livestock is fully assured. This is in no small measure due to the enthusiasm of the workers in the centres and to the able guidance of our Director and others. In the matter of sheep breeding also, our State has been allotted centres under the All-India Scheme and a farm has been established at Nilgiris. Under Poultry development also, various plans have been taken up to improve this infant industry.

Steps have been taken to establish a milk colony for Madras City near Madhavaram which is taking shape very well and is expected to be an accomplished fact in the near future. There are numerous other activities covering other fields of Animal Husbandry that have been taken up in our State. Thus, it may be seen that the various plans of livestock development under the Second Five-Year Plan of our State have gained momentum. To successfully complete them, the unceasing efforts of all Veterinarians are required. Let us therefore dedicate ourselves on this occasion to this noble task of achieving the development of livestock in all directions as envisaged under the National Plan.

In addition to the various activities and plans that have been taken up for the development of livestock in our State, it is necessary that greater facilities are provided for research with adequate funds.

Before I conclude, ladies and gentlemen, I thank the President of the Madras State Veterinary Association in agreeing to hold the Conference at Ranipet which has no doubt given an opportunity to you all to visit this Institute and see the working of the various departments.

I offer a most cordial welcome to all of you especially those colleagues who have come from distant places in the State. I take this opportunity of extending a hearty welcome to our colleagues in the new district of Kanyakumari recently added to our State. I hope your stay here will be quite enjoyable and beneficial. We have done all that we could to make your stay here as comfortable as possible, and we request you to bear with us for shortcomings if any. I extend a hearty welcome to our other guests of this morning, who have honoured us with their presence.

I have great pleasure in requesting Sri K. N. Srinivasan, Mayor of Madras to inaugurate the Conference and the Director of Animal Husbandry to preside.

Sri K. N. Srinivasan, the Mayor of Madras, who inaugurated the conference said that Cattle wealth needed quite a lot of improvement, if agriculture were to advance in our Country. With one third of world's cattle population in India, the work of the Veterinary Surgeons in this land is very arduous and he called for their utmost effort. They needed patience and perseverance to deal with these dumb animals and he wished them all success!

Sri D. Pattabiraman the Director of Animal Husbandry who presided, gave expression to the following illuminating address:—

LADIES AND GENTLEMEN,

Let me express my thanks to the members of my profession for having called upon me to preside over the deliberations of this Twelfth Madras State Veterinary Conference and I deem it a privilege and an honour done by the profession. The State of Madras has shrunk now considerably but I remember the days when delegates from nearly twenty-five districts of the Composite State used to gather at such conferences in the past and make them of great benefit both to the profession and to the country. When I look back on the long line of illustrious presidents who guided the deliberations of such conferences in the past, I feel honoured to be placed in the galaxy of such men. I only hope, you have done me this honour not by virtue of my present position but by my humble record of work which I had pursued with great devotion and zeal to the best of my lights for well over twenty-seven years now. I thank you again Mr. Chairman and members of the Reception Committee for this singular honour extended to me.

Madras has often been described as the intellectual capital of India by no less a person than our beloved Prime Minister. He is not a person to indulge in hyperbole. As in all other walks of life, Madras has been giving an intellectual lead even in the Animal Husbandry field. So far back as 1920 a small group of fifteen members of our profession met at a conference in this very same district and not far away from this place. I refer to Vellore and the

conference was inaugurated by no less a person than the late lamented Sri V. C. Vellingiri Gounder of Coimbatore district, who was taking a keen interest in the welfare of our profession till his death. Ever since then, Madras has been the hub of all Veterinary activities in India. She soon organised in collaboration with the Punjab and Uttar Pradesh an 'All India Veterinary Association' which to this day has to its credit many an achievement. Perhaps its greatest achievement is the starting of a professional journal, the *Indian Veterinary Journal* which has consistently served the cause of science and the profession.

Our pleasure is all the more great now since we have in our midst its present able Editor, Sri Rao Sahib T. Vinayaka Mudaliar who, though connected intimately from the very inception of that journal and its career all these years, has only recently shouldered its entire responsibilities and is giving us the benefit of his rich and varied experience through its pages. His able editorship is openly acknowledged now wherever I go in India and he has raised the standard of the journal within the short period he has been its sole editor. His right lead to the profession on all matters of importance through his illuminating editorials is a matter that cannot be too highly praised. My only prayer is that he may be spared long, sound in body and mind to continue his unique services to our profession for many many more years to come!

Now our thoughts naturally go to our previous editor Dr. Pangal Srinivasa Rao, who had to retire two years ago due to advancing age but who had kept the journal alive for 31 years under very adverse circumstances. We miss him in this gathering but we are deeply grateful to him and wish him a long life with good health and prosperity.

The Madras Veterinary Association is a recognised body by the Government of Madras. Successive Governments have always treated with great consideration the several requests of this Association. I assure you, gentlemen, we cannot have a more **sympathetic Government than the one we are having at present. They are quite alive to the enormity of the Animal Husbandry problems in our State and the necessity for rapid advancement of our work.**

As President of the conference you expect me to touch upon some of the important problems engaging the attention of the department and the Government. First and foremost is the Act for the Registration of Veterinary Practitioners in this State. You would have noticed in the papers that a Bill is being introduced on this subject in the current session of the Legislative Assembly and it may not be long before it is an Act in our State. That is the culmination of sustained work done by the profession for well over three decades to achieve this object. That will give us a Council to control and safeguard the interests of the Profession. Bombay and Uttar Pradesh have already such Acts on their Statute books and I am sure other States would follow soon. That paves the way for putting the Interim Indian Veterinary Council on a statutory basis soon.

The next subject of importance is the upgrading of our College and of this Institute of Preventive Medicine. We have to keep pace with our rapidly advancing science in all its branches. We cannot do this unless we have facilities for advanced work and study and for

specialisation. The Government and the Indian Council of Agricultural Research have agreed to upgrade the Madras Veterinary College and make it an All-India Centre for post-graduate studies. Buildings costing over eight lakhs of rupees are already coming up and Madras will soon have a first class College of Animal Husbandry and Veterinary Science in our land for post-graduate studies and specialisation. Similarly it is on our card to upgrade this Institute of Veterinary Preventive Medicine and make it a first class Research Institute as well, in this part of our country. It is upto you young men and women of our profession to take time by the forelock and equip yourselves in these institutions thoroughly and well for the task that awaits you in the not distant future.

All aspects of livestock work are receiving the best attention of the department. The establishment of key village centres and supplementary extension centres in rural areas is a step of great importance, which may change the face of the entire livestock work in this country. But it needs your close study and timely intervention whenever and wherever it may chance to falter and err. Master the ethics of this problem well and give the necessary intelligent lead and guidance. Remember, with it is involved the question of better cattle, more milk and more food production. We are fortunate to be free from Rinderpest in our State and that has given us the necessary relief to attend to developmental work. Make the best use of this phase in the disease position of cattle in this State.

Several schemes are in progress to produce more milk, more meat and more eggs. As you know we have our Government Milk Factory putting out toned milk. Its daily output is well over 6,000 lbs. now. The Madras Milk Colonisation Scheme is taking shape and when it is an accomplished fact, it would be the realisation of a long standing ambition of the people of Madras. We could give them purer, cleaner, safer and cheaper milk.

Next we are fast developing our live-stock farms at Hosur, Orathanad and Pudukottai. There are proposals before the Government to open more farms. There is one big cattle farm coming up now in Ramanathapuram District. The Sheep Farm at Ootacamund for production of wool of finer quality promises to be a great success in years to come and there is another farm at Chinnasalem for mutton variety of sheep and another regional farm close to Madras in Chingleput District is taking shape now. Several Poultry units are opened all over the State. **On the whole our staff are doing splendid work, but the field is vast and labourers few. We need more and more men and yet more men.** Provision has been made for increased admission in our College but the response so far has been very disappointing.

That takes me to the vital question of the pay structure of the profession. The profession has been asking for Rs. 200 to Rs. 400. I personally think it is a very modest and reasonable request. Unless the pay and prospects are improved, we will be terribly handicapped in the progress of our work.

Ladies and Gentlemen, the Madras Veterinary Association has a hoary past. Its fine record of work has been the envy of many other

States. You are now the torch bearers of that Association. Unless you show the same spirit of sacrifice, service, team work and professional interest, as the pioneers of olden days you will be failing to consolidate what you have gained so far. Become members of the Association and subscribe for its journal. I learn that the *Indian Veterinary Journal* is to become a monthly from January 1958. All honour to our workers in that field. It is up to you to support it with professional papers, clinical articles, etc., and subscribe for the journal and try and enrol more subscribers. In fact one journal is not enough for our vast country. More may come in, as we keep on advancing. Let us support for the present the existing one. Ladies and Gentlemen, I have nothing more to add except saying that I thank you once again.

Next the messages received from the following gentlemen were read out by the Secretary of the conference, Sri K. Ramani.

Dr. M. S. Sastry;	Dr. M. Anant Narayan Rao;
" S. V. Mudaliar;	" P. Sreenivasa Rao;
" C. Dharmalingam;	" K. S. Venkataraman;

Dr. N. V. Doraiswamy and the Madras State Veterinary Assistant Surgeons' Service Association.

The President then requested Mr. G. R. Visvanathan a retired Superintendant of the Institute, to address the gathering. He recounted in full the infant days of the Institute with all its teething troubles and various other infantile diseases and expressed satisfaction at the increased opportunities now afforded and exhorted the profession to contribute their utmost to the development of the State.

After a group photograph the election of the Subjects Committee took place and then the plenary session broke up to meet again at 5 p.m. on the same day.

The subjects committee met between 2 and 4 p.m. and considered the resolutions brought forward and the professional papers presented.

The plenary session met again at 5 p.m. when the following resolutions were moved and adopted.

1. This conference places on record its profound sorrow at the sad demise of Sri A. J. John, Governor of Madras and conveys its heart-felt condolences to Mrs. John and other members of the bereaved family. (From the Chair, all standing in silence for 2 minutes)

2. This conference regrets to note that no member of this profession was nominated on the Committee appointed by the Government of Madras to go into the feasibility of establishing a Rural University in this State, wherein Agriculture and Animal Husbandry have to play an important role in the State. The conference further records its disapproval of the proposed integrated course of Animal Husbandry and Agriculture under the nomenclature of Animal Science at the Agricultural College, Coimbatore. (Moved by Sri V. S. Alwar and seconded by Dr. C. I. John.)

3. This conference resolves to request the Government of India to revive the All India Cadre of Indian Veterinary Service so as to place this profession on a par with the other All-India Services for effective implementation of the various developmental Animal Husbandry Schemes. (Moved by Dr. V. Satchidanandan and seconded by Dr. V. S. Alwar.)

4. Resolved that this conference is of opinion that the poor number of applications received this year for admission into the Madras Veterinary College is mainly due to the unattractive scale of pay offered for a B.V.Sc. with 4 years and one term of intensive professional training after Intermediate in Arts, or 5 years and one term after pre-university course and request the Government to 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/-. This conference resolves further to request the Government that the minimum of the scale of pay of the incumbents of the Madras Animal Husbandry Service may be fixed at a higher stage than the maximum of the scale of pay proposed for the Veterinary Assistant Surgeons. The pay of the personnel already in service may be fixed in the new scales giving due weightage to their service. (Moved by Dr. M. N. Menon and seconded by Dr. Vedanayagam.)

5. Resolved that this conference is of opinion that the question of representation of Veterinarians on Legislative bodies should be urgently considered by the Government and that the choice of a nominee should be made in consultation with the All-India Veterinary Association in the case of Parliament and the State Veterinary Association in the case of State Legislative Council. (Moved by Dr. M. C. Chellam and seconded by Dr. V. S. Alwar.)

For want of time the professional papers were taken as read and they were:—

1. Studies on the Life-history and Bionomics of Sarcophaga.
2. On a species of *Vogeloides* from cats in India.
3. Notes of Parasitological interest.
4. Viability trials on *Trypanasoma evansi* *in vitro* and in carcasses.
5. Sheep-Pox Vaccination.

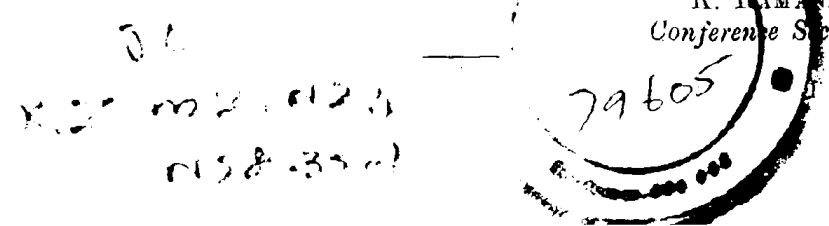
The President next asked Sri T. Vinayaka Mudaliar President of the Madras Veterinary Association to address the gathering. He dwelt upon the rapid strides the profession had taken and said that it was time the members of the profession started to specialise in the several branches of our Science. He threw out the suggestion that the time was auspicious to bring into existence an independent cadre of Veterinary private practitioners and appealed to the members to carefully nurture and strengthen the association. The President of the conference in his concluding remarks appealed to the members of the profession to work hard and help to make the Second Five-Year plan a success.

On behalf of the delegates Messers K. S. Krishnappa, Dr. Neelakanta Iyer and T. Sivaraman thanked the Chairman and members of the Reception Committee and the other members of the Staff of the Institute for the excellent arrangements made for the boarding and lodging of members.

With a vote of thanks proposed by Sri S. Vancheswara Iyer, the function came to a close.

In the night the delegates were entertained to a *dehna* "Kattabomman", by the students of the Basic Training School, Arad.

K. RAMANI,
Conference Secretary.



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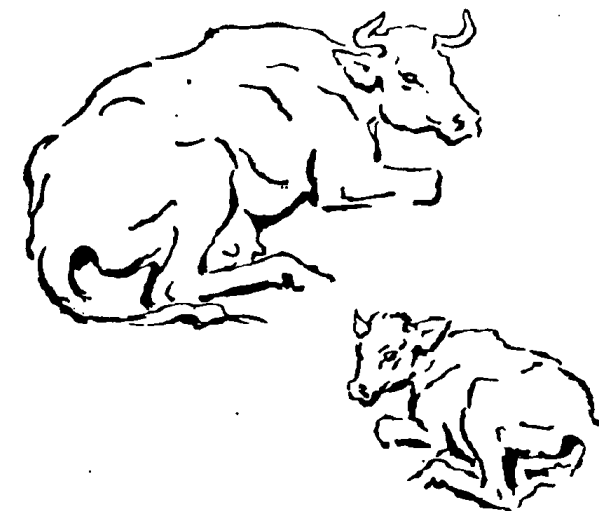
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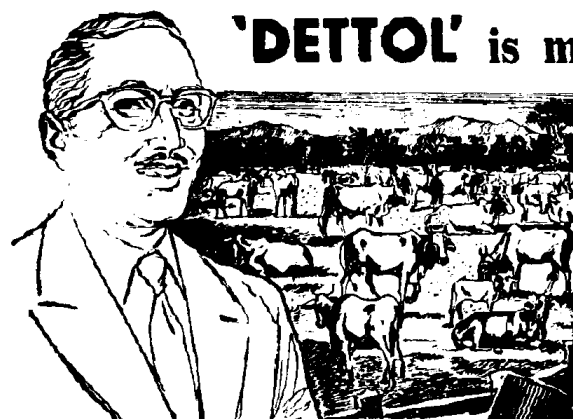
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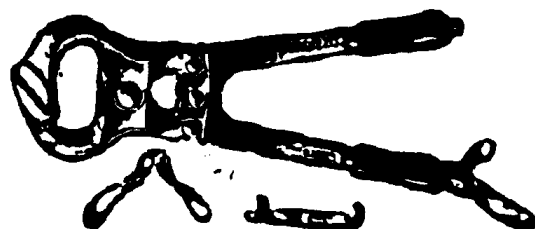
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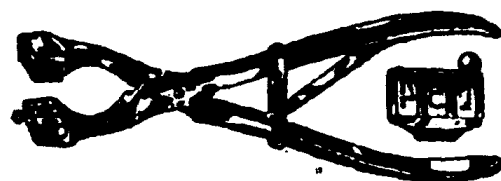
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