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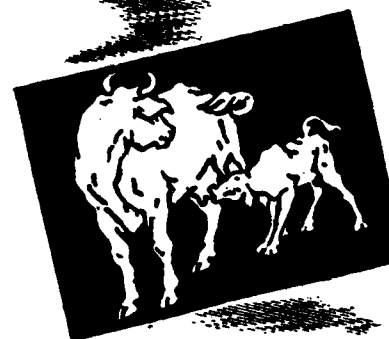
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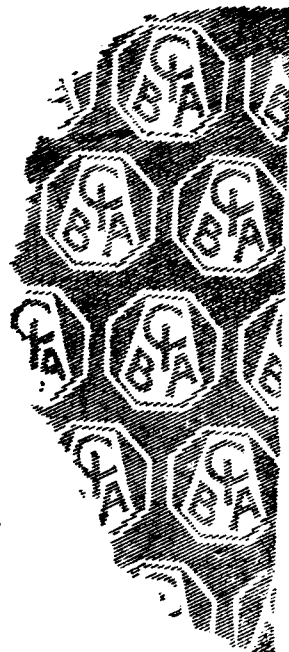
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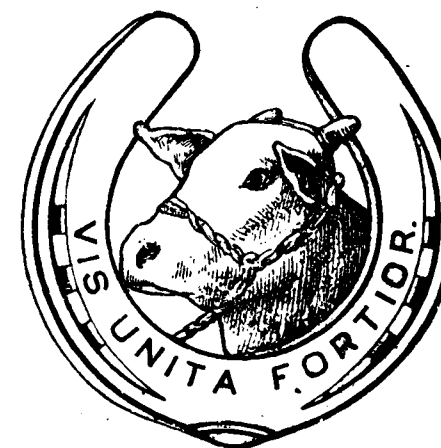
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September 1947
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(The Journal of the All-India Veterinary Association)



Editor:

P. SRINIVASA RAO, G.M.V.C.
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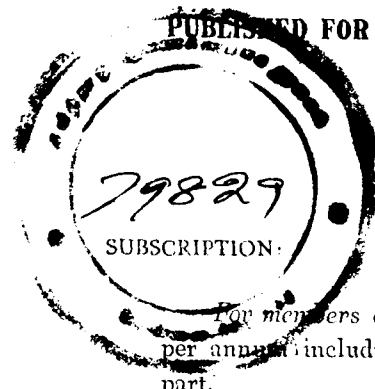
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A Bi-monthly Record of Veterinary Medicine and Surgery
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PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION

EDITOR:

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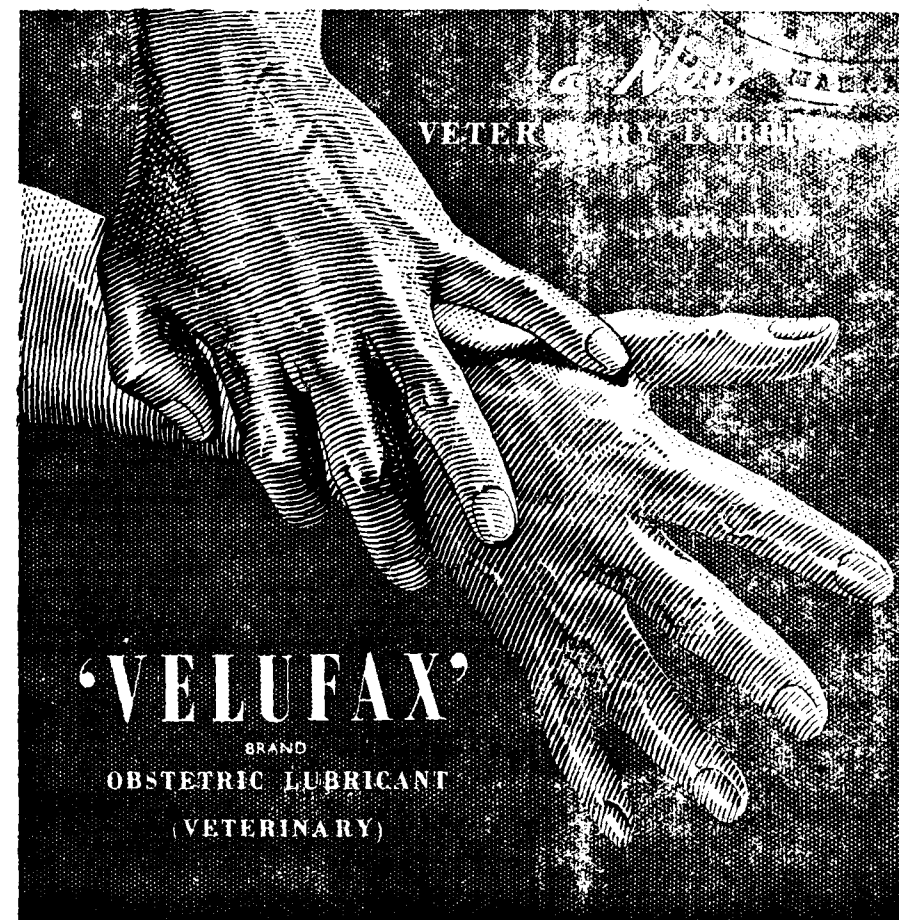
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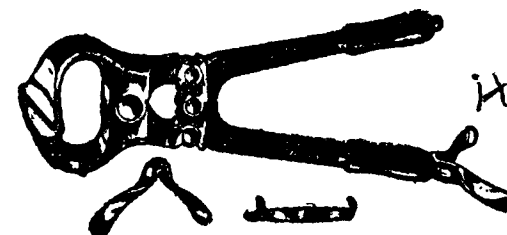
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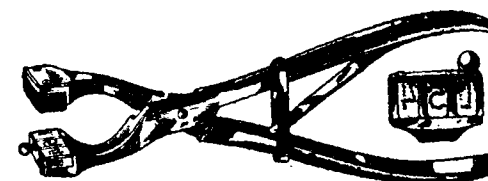
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SEPTEMBER, 1947

No. 2

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The Indian Veterinary Journal

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PANDIT JAWAHARLAL NEHRU,
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Pandit Jawaharlal Nehru's call to the Nation

The Appointed Day has come—the day appointed by destiny, and India stands forth again after long slumber and struggle—awake, vital, free and independent. The past clings on to us still in some measure and we have to do much before we redeem the pledges we have so often taken. Yet the turning point is past, history begins anew for us, the history which we shall live and act, and others will write about.

It is a fateful moment for us in India, for all Asia and for the world. A new star rises, the star of freedom in the East, a new hope comes into being, a vision long cherished materialises. May the star never set and that hope never be betrayed.

We rejoice in that freedom, even though clouds surround us, and many of our people are sorrow-stricken and difficult problems encompass us. But freedom brings responsibilities and burdens and we have to face them in the spirit of a free and disciplined people.

On this day our first thoughts go to the Architect of this freedom, the Father of our Nation who, embodying the old spirit of India, held aloft the torch of freedom and lighted up the darkness that surrounded us. We have often been unworthy followers of his and have strayed from his message, but not only we, but succeeding generations, will remember this message and bear the imprint in their hearts of this great son of India, magnificent in his faith and strength and courage and humility. We shall never allow that torch of freedom to be blown out, however high the wind or stormy the tempest.

Our next thoughts must be of the unknown volunteers and soldiers of freedom who, without praise or reward, have served India even unto death.

We think also of our brothers and sisters who have been cut off from us by political boundaries and who unhappily cannot share at present in the freedom that has come. They are of us and will remain of us whatever may happen, and we shall be sharers in their good and ill fortune alike.

The future beckons to us. Whither do we go and what shall be our endeavour? To bring freedom and opportunity to the common man, to the peasants and workers of India. To fight and end poverty and ignorance and disease. To build up a prosperous, democratic and progressive nation, and to create social, economic and political institutions which will ensure justice and fullness of life to every man and woman.

We have hard work ahead. There is no resting for any one of us till we redeem our pledge in full, till we make all the people of India what destiny intended them to be. We are citizens of a great country, on the verge of bold advance, and we have to live up to that high standard. All of us to whatever religion we may belong are equally the children of India with equal rights, privileges and obligations. We cannot encourage communalism or narrow-mindedness, for no nation can be great whose people are narrow in thought or in action.

To the nations and peoples of the world we send greetings and pledge ourselves to co-operate with them in furthering peace, freedom and democracy.

And to India, our much-loved motherland, the ancient, the eternal and the ever-new, we pay our reverent homage and we bind ourselves afresh to her service.

The Appointed Day has come when the appointed by destiny, and in this stands forth again after long slumber and long life, a new and independent. The past things on to us and in some measure and we have to do much before we return the pledges we have so often taken. Yet the turning point has finally begun now for us the history which we shall live and act as fathers & I write about.

that hope never be betrayed.
 And a vision long cherished unattained.
 May the star never set and
 A new era dawn; the star of freedom in the East a new hope comes to
 It is a joyful moment for us in India, for all Asia and for the world.

W

In this day one first thought is to the freedom of our Nation who are living the old spirit of individualism. We need more unity and lighted up in darkness that surrounded us. We have been unworthy followers of him and have strayed from his path. But not only we but succeeding generations will remember this day as the beginning of their hearts to this great son of India. Let them find strength and courage and humanity. We shall appoint in the north and south and east and west.

We allow that torch of freedom to be blown our power right the wind blowing the torch

For next to nothing must be known about volunteers and soldiers
who without protest or reward have served in the past and

We think also of our brethren and sisters who have been cut off from us by political boundaries and who happily cannot share at present the freedom that has come. They are of us and will remain of us whatever may happen, and we shall be sisters in that good and ill fortune.

The future beckons to us. Whether do we go and what shall be our endeavour? To bring freedom and opportunity to the common man, to the peasant and workers of India. To fight and overthrow the ignorance and disease. To build up a prosperous democratic and progressive nation, and to create social, economic and political institutions which will ensure the well-being and fullness of life to every man and woman.

There is no resting for any one of us until we have reached the high standard of the children of the South. We cannot encourage the children of the South to live up to that high standard, but we must live up to it ourselves, and we must live up to that high standard of the children of the South. We cannot encourage the children of the South to live up to that high standard, but we must live up to it ourselves, and we must live up to that high standard of the children of the South.

To the nations and peoples of the world we send greetings and

And to India our much-loved motherland, the ancient, the eternal
of the ever-new we pay our reverent homage and we bind ourselves
to her service

(The Journal of The All-India Veterinary Association)

No. 2

AN UNIOUE EXPERIENCE.

RAO BAHADUR R. SWAMINATHAN, B.A., G.M.V.C.

Going over my professional jottings, I have come across the following interesting record, which, for some inexplicable reason, has remained unpublished till now.

On the 3rd April 1925, the Sub Inspector of Police, Kandal, a suburb of Ootacamund in South India, sent me seven carcasses of sheep and three live sheep with injuries, for examination and report on the cause of the deaths and the nature of the injuries. The history given was that the animals had been locked in during the night as usual in a perfectly healthy condition and that, on opening the place the next morning, a number of animals were found dead, while a few others had injuries on them.

On post-mortem examination, 4 sheep had dislocation of the 2nd cervical vertebrae while 3 had compound comminuted fracture of the cranial vault. The fractured pieces of bone had entered into the substance of the brain.

The injuries on the live animals were simple and consisted of long incised wounds, not of a deep nature, on the neck; two had torn ears.

A visit to the place of the incident showed that a flock of about 30 sheep was kept in the outskirts of the village in a walled-in tiled building and that, as usual, the animals were brought in the previous evening after grazing and locked in for the night. Besides the main doorway, there were two windows, 4'x3', on the sides of the building at a height of about 5

feet from the ground and they had neither doors nor cross-bars. Next morning, when the servant opened the door to let out the animals, a terrible sight was on view with dead and injured animals.

Naturally everyone was aghast at this and the owner's suspicion fell on a near relation of his, as the instigator of this slaughter, because they were on inimical terms. I could not imagine any human being to be so very perverted as to pole-hammer, or twist the necks of, so many innocent sheep and so I ruled that out. At the same time I could not unravel the mystery attending these deaths. I, therefore, had a consultation with Dr. H. E. Browne, an experienced Veterinary Surgeon practising at Ootacamund. The moment he heard my history of the case, he came out with his diagnosis and gave it out with an emphatic assertion. He also described very graphically the manner in which the fatal injuries should have been inflicted. Evidently it was all the result of his extensive *Shikar* in his younger days. In short, according to Dr. Browne, the deaths had been caused by a Tigress teaching her cub, or cubs how to kill sheep. I was rather sceptic about this opinion, but very soon got disillusioned when on my way back home, I heard the gossip of the town that a tigress had been located in a shola (a thickly wooded jungle) adjacent to the town. By evening, the shikaries had shot that tigress and also 2 cubs and were parading the trophies in their usual way.

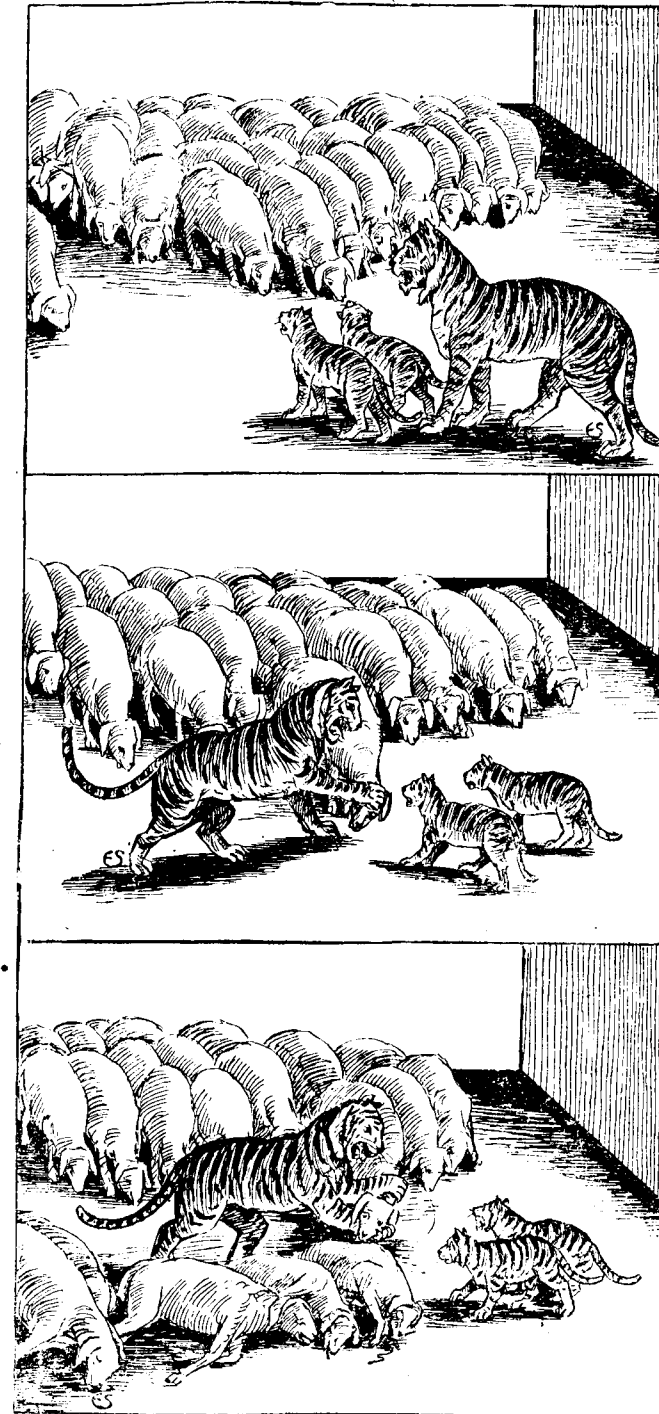
According to Dr. Browne, the tigress must have been teaching her cubs in the following manner after having got into the building through one of the side-windows.

A subsequent examination of the pen revealed the hairs of the tigress sticking on the sides of a side-window, as evidently she had to squeeze herself in through the narrow opening.

The moment the sheep see the tigress, they run helter-skelter, and then sheep-like, gather together in a corner of the enclosure. The tigress with her cubs stands in front of them practically hypnotising them to a standstill with her luminous eyes. Then, sitting on the haunches, she dislocates the neck of the animals, with one front leg on the side of the neck and the other leg on the opposite cheek. Alternatively, the sheep is hit violently on the head by the powerful paw of the tigress. In either case the death is instantaneous.

An extraordinary lesson, it may be said! Yes, it is indeed extraordinary. It appears, it is unusual for a tigress to spoil the sanctity of the school by having a meal there after the lesson is taught! or it may be she scents some disturbance by a prolonged stay in the school. The injuries on the sheep might have been caused by the young cubs in their attempts of practising the lessons on the victims.

SHEEP AND THE TIGRESS—DEMONSTRATION OF KILLING BY THE LATTER TO HER CUBS.



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A MARK TO REMEMBER

The above incident, while it is highly revealing, illustrates the dictum of old *viz.*, "what we know is only just a handful, what we do not know is as vast as the world."

The enclosed three text figures may give the readers an idea of how the tigress is said to teach her cubs in the art of killing sheep.

A CHECK-LIST OF PARASITES, (CLASS—NEMATODA) IN THE DEPARTMENT OF PARASITOLOGY, MADRAS VETERINARY COLLEGE LABORATORY.

(Continued from Page No. 434, Vol. XXIII)

BY

S. V. MUDALIAR, G. M. V. C.

(Lecturer in Parasitology, Madras Veterinary College)

AND

V. S. ALWAR, B.V.Sc.

(Assistant, Department of Parasitology)

PHYLUM NEMATHELMINTHES Voigt (quoted by Carus, 1863)

Class *NEMATODA* Rudolphi, 1808.

Order *ASCARIDEA* Railliet and Henry, 1915.

Family *ASCARIDAE* Baird, 1853.

Genus *Ascaris* Linnaeus, 1758.

A. lumbricoides Linnaeus, 1758.

Host. man.

Location. Intestine (passed in faeces)

Locality. Madras. (1932)

A. lumbricoides (suis) Linnaeus, 1758.

Host. Pig.

Location. Intestine.

Locality. Malay States. Butterworth (1937)

A. vitulorum Goeze, 1782.

Host. Calf.

Location. Intestine.

Locality. Madras. (1922)

A. equorum Goeze, 1782.

Host. Horse.

Location. Intestine.
Locality. Madras (1922)

A. sp.

Host. Brown bear, bandicoot, mountain squirrel.

Location. Intestine.

Locality. Madras zoo, Madras, Kodaikanal (1923, 1930, 1940)

Genus *Ophidascaris* Baylis, 1921.

O. sp.

Host. King cobra.

Location. Intestine.

Locality. Cochin State. Trichur zoo (1940)

Genus *Toxocara* Stiles, 1905.

T. canis (Werner, 1782)

Host. Dog, tiger.

Location. Intestine.

Locality. Madras zoo (1923)

T. mystax. (Zeder, 1800)

Host. Cat, tiger.

Location. Intestine.

Locality. Madras, Madras zoo, Bobbili, Coorg (1923)

Genus *Toxascaris* Leiper, 1907.

T. leonina (V. Linstow, 1902)

Host. Dog, tiger, lion.

Location. Intestine.

Locality. Madras, Nellore (Kavali), Kurnool, Madras zoo (1923)

T. transfuga (Rudolphi, 1819)

Host. Bear.

Location. Intestine.

Locality. Madras and Cochin zoos (1929)

Genus *contracaecum* Railliet and Henry, 1912.

C. sp.

Host. Kite.

Location. Intestine.

Locality. Madras (1932)

Family HETERAKIDAE Railliet and Henry, 1914.

Genus *Heterakis* Dujardin, 1845.

H. gallinae (Gmelin, 1790)

Host. Fowl.

Location. Caecum.
Locality. Madras (1923)

H. pusilla V. Linstow, 1906.

Host. Fowl.

Location. Intestine.

Locality. Madras (1938)

H. spumosa Schneider, 1866.

Host. Bandicoot.

Location. Intestine.

Locality. Madras (1929)

H. sp.

Host. Frog.

Location. Intestine.

Locality. Madras (1931)

Genus *Ascaridia* Dujardin, 1845.

A. galli (Schränk, 1788)

Host. Fowl, duck.

Location. Intestine.

Locality. Madras (1922)

Genus *Subulura* Molin, 1860.

S. sp.

Host. Squirrel

Location. Intestine

Locality. Madras (1930)

Family OXYURIDAE Cobbold, 1864.

Genus *Oxyuris* Rudolphi, 1803

O. equi (Schränk, 1788)

Host. Horse

Location. floating colon

Locality. Madras (1922)

Genus *Passalurus* Dujardin, 1845.

P. ambiguus (Rudolphi, 1819)

Host. Black rat

Location. Colon

Locality. Madras (1930)

Genus *Skrjabinema* Vereschagin, 1926.

S. ovis (Skrjabin, 1915)

Host. Goat

Location. Large intestine

Locality. Madras (1939)

Genus *Enterobius* Leach, in Baird, 1853

E. vermicularis (Linnaeus, 1758)

Host. Man

Location. Intestine (passed in faeces)

Locality. Madras. (1928)

Genus *Pharyngodon* Diesing, 1861

P. sp.

Host. Frog, house lizard

Location. Intestine

Locality. Madras (1931)

Family RHABDIDAE Micoletzky, 1922.

Genus *Strongyloides* Grassi, 1879.

S. papillosus (Wedl, 1856) Ransom, 1911

Host. Calf, monkey.

Location. Intestine

Locality. Madras

Order STRONGYLOIDEA Weinland, 1858.

Family STRONGYLIDAE Baird, 1853.

Genus *Strongylus* Muller, 1780.

S. equinus Muller, 1780.

Host. Horse, mule.

Location. Caecum, colon.

Locality. Madras (1923)

S. edentatus (Looss, 1900)

Host. Horse, ass.

Location. Caecum, colon.

Locality. Madras (1923)

S. vulgaris (Looss, 1900)

Host. Horse, mule.

Location. Caecum, colon.

Locality. Madras (1923)

Genus *Decrusia* Lane, 1914.

D. additicta (Railliet, Henry and Bauche, 1914)

Host. Elephant.

Location. Intestine.

Locality. Madras zoo, Malabar (Manantody) (1923)

Genus *Equinurbia* Lane, 1914.

E. sipunculiformis (Baird, 1859)

Host. Elephant.

Location. Intestine.

Locality. Madras zoo (1923)

Genus *Choniangium* Railliet, Henry and Bauche, 1914.

C. epistomum Piana and Stazzi, 1900.

Host. Elephant

Location. Intestine.

Locality. Madras zoo (1923)

Genus *Oesophagodontus* Railliet and Henry, 1902.

O. robustus (Giles, 1892)

Host. Pony.

Location. Colon.

Locality. Madras (1939)

Genus *Triodontophorus* Looss, 1902.

T. serratus Looss, 1900.

Host. Horse.

Location. Colon.

Locality. Madras (1923)

T. brevicauda Boulenger, 1916.

Host. Horse.

Location. Colon.

Locality. Madras. (1937)

T. tenuicollis Boulenger, 1916.

Host. Pony.

Location. Intestine.

Locality. Madras (1937)

Genus *Trichonema* Cobbold, 1874.

T. longibursatum Yorke and Macfie, 1918.

Host. Horse.

Location. Caecum, colon.

Locality. Madras (1923)

T. calicatum Looss, 1900.

Host. Horse.

Location. Colon.
Locality. Madras (1937)

T. poculatum Looss, 1900.
Host. Pony.
Location. Caecum.
Locality. Madras.

T. bicoronatum Looss, 1900.
Host. Horse.
Location. Colon.
Locality. Madras (1937)

T. nassatum Looss, 1900.
Host. Horse.
Location. Colon.
Locality. Madras (1937)

T. pseudo-catinatum Yorke and Macfie, 1919.
Host. Horse.
Location. Colon.
Locality. Madras (1937)

T. pateratum York and Macfie, 1919.
Host. Pony
Location. Caecum.
Locality. Hyderabad (1938)

T. radiatum Looss, 1900.
Host. Horse.
Location. Caecum, colon.
Locality. Madras.

T. tetracanthum Mehlis, 1831.
Host. Horse.
Location. Colon.
Locality. Madras (1937)

Genus *Poteriostomum* Quiel, 1919.

P. ratzii Kotlan, 1919.
Host. Horse.
Location. Caecum, colon.
Locality. Madras (1937)

P. imparidentatum Quiel, 1919.
Host. Pony.

Location. Colon.
Locality. Madras (1934)

Genus *Gyalocephalus* Looss, 1900.
G. capitatus Looss, 1900.
Host. Pony, mule.
Location. Caecum, colon.
Locality. Madras (1925)

Genus *Quilonia* Lane, 1914.

Q. renniei Railliet, Henry and Joyeux, 1913.
Host. Elephant.
Location. Intestine.
Locality. Madras zoo (1923)

Q. travancra Lane, 1914
Host. Elephant.
Location. Intestine
Locality. Madras zoo (1923)

Q. apiensis Geddoelst, 1916
Host. Elephant
Location. Intestine
Locality. Malabar (Manantody) (1942)

Genus *Murshidia* Lane, 1914

M. murshida Lane, 1914.
Host. Elephant
Location. Intestine
Locality. Madras zoo, Malabar (Manantody), Cochin State (Vadankanchery) (1923)

M. falcifera Cobbold, 1882
Host. Elephant
Location. Intestine
Locality. Madras zoo (1923)

M. indica Ware, 1924
Host. Elephant
Location. Intestine
Locality. Madras zoo (1923)

Genus *Bourgelatia* Railliet, Henry and Bauche, 1919
B. diducta Railliet, Henry and Bauche, 1919
Host. Pig

Location. Intestine
Locality. Madras. Nilgiris District. Ooty. (1932)

Genus *Amira* Lane, 1914
A. pileata Railliet, Henry and Bauche, 1914
Host. Elephant
Location. Intestine
Locality. Madras zoo (1923)

Genus *Oesophagostomum* Molin, 1861
O. dentatum Rudolphi, 1803
Host. Pig
Location. Intestine
Locality. Madras. Nilgiris District. Ooty (1931)

O. venulosum Rudolphi, 1809
Host. Sheep, Goat
Location. Intestine
Locality. Madras. Nellore. Venkatagiri. (1938)

O. columbianum Curtice, 1890
Host. Sheep.
Location. Intestine.
Locality. Madras (1923)

O. radiatum Rudolphi, 1803
Host. Cattle
Location. Intestine
Locality. Madras (1923)

O. brumpti. Railliet and Henry, 1905
Host. Monkey
Location. Intestine.
Locality. Madras zoo, Bombay (Haffkine Institute) (1923, 1937)

Genus *Ternidens* Railliet and Henry, 1909
T. diminutus Railliet and Henry, 1905
Host. Orangutan
Location. Intestine
Locality. Madras zoo (1925)

Genus *Stephanurus* Diesing, 1839
S. dentatus Diesing, 1839
Host. Pig
Location. Kidney, liver
Locality. Madras slaughter-house, Malaya (1924)

Genus *Syngamus* V. Siebold, 1836

S. trachea (Montagu, 1811)

Host. Fowl

Location. Larynx, trachea

Locality. Madras. Malabar. Tellichery, Malay State. Butterworth (1931)

S. laryngeus Railliet, 1899

Host. Bull

Location. Larynx

Locality. Muktesar, U. P. (1925)

Family ANCYLOSTOMIDAE Looss, 1905

Genus *Ancylostoma* Dubini, 1843

A. duodenale Dubini, 1843

Host. Man

Location. Intestine

Locality. Madras

A. caninum Ercolani, 1859

Host. Dog, tiger, jackal

Location. Intestine.

Locality. Madras (1923)

A. braziliense Gomez de Faria, 1910

Host. Dog, cat.

Location. Intestine

Locality. Madras, (1923)

Genus *Galonus* Railliet, 1918

G. perniciosus (V. Linstow, 1885)

Host. Cheetah

Location. In nodules of small intestine

Locality. Madras. Salem District. Hosur Cattle Farm

Genus *Agriostomum* Railliet, 1902

A. vryburgi Railliet, 1902

Host. Calf

Location. Intestine

Locality. Madras. Ooty. (1939)

Genus *Necator* Stiles, 1903

N. americanus Stiles, 1902

Host. Man

Location. Intestine (passed in faeces)

Locality. Madras (1928)

- Genus *Gaigeria* Railliet and Henry, 1910
G. pachyscelis Railliet and Henry, 1910
 Host. Goat
 Location. Intestine
 Locality. Madras. Nellore (1938)
- Genus *Uncinaria* Frolich, 1789.
U. stenocephala (Railliet, 1884)
 Host. Pig.
 Location. Intestine.
 Locality. Madras slaughter house, (1932)
- Genus *Grammocephalus* Railliet and Henry, 1910.
G. varedatus. Lane, 1921.
 Host. Elephant.
 Location. Liver, bile ducts.
 Locality. Madras zoo, Malabar. Manantody. (1923)
- Genus *Bathmostomum* Railliet and Henry, 1909.
B. sangeri (Cobbold, 1879)
 Host. Elephant.
 Location. Intestine.
 Locality. Madras zoo, (1923)
- Genus *Arthrocephalus* Orllepp, 1925.
A. gambiensis Orllepp, 1925.
 Host. Mongoose.
 Location. Intestine.
 Locality. Madras (1923)
- Genus *Bunostomum* Railliet, 1902.
B. trigonocephalum (Rudolphi, 1808)
 Host. Sheep.
 Location. Intestine.
 Locality. Madras (1923)
- B. phlebotomum* (Railliet, 1900)
 Host. Cattle.
 Location. Intestine.
 Locality. Madras (1923)
- Genus *Kalicephalus* Molin, 1861.
K. willeyi V. Linstow, 1904.
 Host. Russel's viper.
 Location. Intestine.
 Locality. Madras. Salem District. Hosur Cattle Farm. (1945)

Family TRICHOSTRONGYLIDAE Leiper, 1912.

Genus *Trichostrongylus* Looss, 1905.*T. axei* (Cobbold, 1879)

Host. Cattle, sheep.

Location. Abomasum.

Locality. Madras (1939)

T. colubriformis (Giles, 1892)

Host. Goat.

Location. Abomasum, duodenum.

Locality. Madras (1938)

Genus *Haemonchus* Cobb, 1898.*H. contortus* (Rudolphi, 1803)

Host. Sheep.

Location. Abomasum.

Locality. Madras (1923)

Genus *Oswaldocruzia* Travassos, 1917.*O. sp.*

Host. Frog.

Location. Intestine.

Locality. Madras (1928)

Genus *Cooperia* Ransom, 1907.*C. pectinata* Ransom, 1907.

Host. Cattle.

Location. Abomasum.

Locality. Madras slaughter-house. (1939)

C. punctata (V. Linstow, 1907)

Host. Cattle

Location. Abomasum.

Locality. Madras slaughter-house. (1939)

C. sp.

Host. Deer.

Location. Duodenum.

Locality. Madras (1946)

Genus *Mecistocirrus* Railliet and Henry, 1912.*M. digitatus* (V. Linstow, 1906)

Host. Cow, deer.

Location. Abomasum.

Locality. Madras (1923)

Family METASTRONGYLIDAE Leiper, 1908.

Genus *Metastrongylus* Molin, 1861.

M. apri (Gmelin, 1790)

Host. Pig.

Location. Lung.

Locality. Madras. Ooty (1923)

Genus *Dictyocaulus* Railliet and Henry, 1907.

D. viviparus (Bloch, 1782)

Host. Cattle.

Location. Lung

Locality. Muktesar, U. P., (1925) Coorç (1935)

D. filaria (Rudolphi, 1809)

Host. Sheep.

Location. Lung.

Locality. Madras. Ooty, Muktesar, U. P. (1939)

D. arnfieldi Cobbold, 1884.

Host. Pony.

Location. Lung.

Locality. Madras (1947)

Order FILARIOIDEA Wienland, 1858

Family FILARIIDAE (Cobbold, 1864) Claus, 1885

Genus *Dirofilaria* Railliet and Henry, 1911

D. immitis (Leidy, 1856)

Host. Dog.

Location. Heart

Locality. Madras (1922)

Specimens in situ in the heart received from Malaya by courtesy of
Sri. A. R. Kuppuswamy in 1938

Genus *Dipetalonema* Diesing, 1861

D. dracunculoides Cobbold, 1870

Host. Dog, antelope

Location. Peritoneal cavity

Locality. Madras. Ramnad District. Rajapalayam (1935)
Forest Department (1926)

Genus *Onchocerca* Diesing, 1841

C. indica Sweet, 1915

Host. Cattle, buffalo

Location. Brisket

Locality. Madras. Kumbakonam (1923)

O. armillata Railliet and Henry, 1909

Host. Cattle, buffalo

Location. Aorta

Locality. F. M. S. (1925) Madras (1940)

Genus *Paraflaria* Yorke and Mapstone, 1926

P. bovicola Dejesus, 1934

Host. Cow

Location. Subcutaneous tissue

Locality. Madras. Guruzala, Srivilliputhur (1934)

Genus *Setaria* Viborç, 1795

S. equina (Abildgaard, 1789)

Host. Horse, mule

Location. Eye, peritoneal cavity, spinal column

Locality. Madras (1922)

S. cervi (Rudolphi, 1819)

Host. Bullock, horse, antelope

Location. Eye, peritoneal cavity, scrotum, cranial cavity, spinal
column

Locality. Madras (1922)

Genus *Micipsella* Seurat, 1921

M. numidica (Seurat, 1917)

Host. Rabbit

Location. Liver

Locality. Madras. N. Arcot District. T. Malai (1932)

Family PHILOMETRIDAE Baylis and Daubney, 1926

Genus *Dracunculus* Reichard, 1759.

D. medinensis (Linnaeus, 1758)

Host. Dog, horse, man

Location. Subcutaneous tissue.

Locality. Madras (1923)

Family SPIRURIDAE Oerley, 1885

Genus *Habronema* Diesing, 1861

H. muscae Carter, 1861

Host. Horse

Location. Stomach

Locality. Madras (1923)

H. microstoma (Schneider, 1866)

Host. Horse

Location. Stomach

Locality. Madras (1923)

Genus *Draschia* Chitwood and Wehr, 1934

D. megastoma (Rudolphi, 1819)

Host. Horse

Location. Stomach

Locality. Madras. (1922)

Genus *Parabronema* Baylis, 1921

P. indicum Baylis, 1921

Host. Elephant

Location. Intestine

Locality. Madras zoo (1923)

Genus *Ascarops* V. Beneden, 1873

A. strongylina (Rudolphi, 1819)

Host. Pig

Location. Intestine

Locality. Madras slaughter house. (1932)

Genus *Streptopharagus* Blanc, 1912

S. sp.

Host. Monkey

Location. Intestine

Locality. Bombay (Haffkine Institute) (1937)

Genus *Physocephalus* Diesing, 1861

P. sexalatus (Molin 1860)

Host. Pig.

Location. Intestine

Locality. Madras slaughter-house (1932)

Genus *Spirocerca* Railliet and Henry, 1911

S. lupi (Rudolphi, 1809)

Host. Dog.

Location. Oesophagus, aorta

Locality. Madras, (1922)

Genus *Cylicospirura* Ververs, 1922

C. subaequalis (Molin, 1860)

Host. Tiger

Locality. Madras. Kurnool. Venkataçiri (1934)

Genus *Gongylonema* Molin, 1857

G. pulchrum Molin, 1857

Host. Buffalo

Location. Oesophagus

Locality. Madras slaughter house (1937)

G. verrucosum (Giles, 1892)

Host. Cow.

Location. Abomasum.

Locality. Madras (1923)

G. ingluvicola Ransom, 1904.

Host. Fowl.

Location. Crop.

Locality. Madras (1923)

G. orientale Yokogawa, 1925.

Host. White rat.

Location. Intestine.

Locality. Madras (1931)

Genus *Acuaria* Bremser, 1811.

A. hamulosa (Diesing, 1851)

Host. Fowl.

Location. Gizzard.

Locality. Madras. Salem District. Hosur Cattle Farm (1935)

A. spiralis Molin, 1858.

Host. Fowl.

Location. Proventriculus

Locality. Madras, Coimbatore (1931)

Genus *Echinuria* Soloviev, 1912.

E. sp.

Host. Fowl.

Location. Gizzard.

Locality. Madras. Malabar. Palghat (1926)

Genus *Tetrameres* Creplin, 1846.

T. spinosa Maplestone, 1931.

Host. Gallus domesticus

Locality. Madras (1942)

Genus *Physaloptera* Rudolphi, 1819.

P. praeputialis Von Linstow, 1889.

Host. Dog, cat, cheetah, bat.

Location. Stomach.

Locality. Madras. Kurnool (1923)

P. sp.

Host. Squirrel, kite, hawk, iguana.

Location. Stomach., intestine, peritoneal cavity.

Locality. Madras, Coor̃ (1930)

Genus *Thelazia* Bosc, 1819.

T. rhodesii (Desmarest, 1828)

Host. Cattle, buffalo.

Location. Conjunctiva.

Locality. Madras (1923)

T. callipaeda Railliet and Henry, 1910.

Host. Dog.

Location. Conjunctiva.

Locality. Madras (1923)

T. sp.

Host. Fish.

Location. Muscle.

Locality. Coor̃ (1938)

Genus *Oxyspirura* V. Drasche in Stossich, 1897.

O. mansonii (Cobbold, 1879)

Host. Fowl.

Location. Extra-ocular.

Locality. Madras, Malabar. Tellichery (1931)

Genus *Rictularia* Froelich, 1802.

R. mjobergi Baylis, 1928.

Host. Dog, cat, cat-bear.

Location. Intestine.

Locality. Madras (1929)

Genus *Spirura* Blanchard, 1849.

S. sp.

Host. Bandicoot, lizard.

Location. Stomach.

Locality. Madras (1929)

Genus *Metabronema* n. g. Yorke and Maplestone, 1926.

M. sp.

Host. Fish.

Locality. Coor̃. (1931)

Genus *Cyrnea* Seurat, 1914.

C. sp.

Host. Peacock.

Location. Intestine.

Locality. Nãpur, C. P., (1938)

Genus *Cosmocephalus* Molin, 1858.

C. sp.

Host. Kite.

Location. Gizzard

Locality. Madras (1938)

Family GNATHOSTOMIDAE Railliet, 1895

Genus *Gnathostoma* Owen, 1836

G. spinigerum Owen, 1836

Host. Dog, cat

Locality. Madras (1923)

Order TRICHINELLOIDEA Hall, 1916

Family TRICHURIDAE Railliet, 1915

Genus *Trichuris* Roederer, 1761

T. discolor (V. Linstow, 1906)

Host. Calf

Location. Caecum

Locality. Madras (1931)

T. ovis Abildgaard, 1795

Host. Cattle, sheep

Location. Intestine

Locality. Madras, Punjab (1923)

T. globulosa V. Linstow, 1901

Host. Camel

Location. Caecum

Locality. Madras zoo (1935)

T. giraffae (Dies, 1851)

Host. Giraffee

Location. Caecum.

Locality. Madras zoo (1925)

T. leporis (Froelich, 1789)

Host. Wild hare

Location. Intestine
Locality. Coor̃ (1931)

T. muris. (Schr̃ank, 1788)
Host. Black rat
Location. Intestine
Locality. Madras (1928)

T. cameli Rudolphi, 1819
Host. Camel
Location. Intestine
Locality. Jodhpur State (1938)

(sent by the courtesy of the Animal Husbandry Expert of Jodhpur State)

T. trichiura (Linnaeus, 1771)
Host. Monkey
Location. Caecum
Locality. Madras. Coimbatore District. Erode zoo (1938)

T. alcocki Linstow, 1906
Host. Sheep, goat
Location. Intestine
Locality. Madras. Nellore District. Venkataḡiri (1938)

Genus *Capillaria* Zeder, 1800.

C. annulata (Molin, 1858)
Host. Fowl
Location. Crop.
Locality. Madras. Salem District. Hosur Cattle Farm (1942)

C. bovis (Schnyder, 1906)
Host. Cattle
Locality. Madras

To be a first class general practitioner is harder than to be a competent specialist

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SOME ASPECTS OF HAEMATOLOGICAL STUDIES DURING RINDERPEST IN GOATS.

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Rinderpest in goats is by no means easy to diagnose. The characteristic symptoms of the disease as noticed in bovines are absent in goats. Beyond a rise in temperature and an occasional diarrhoea there are no other symptoms met with in these animals. Even on autopsy, the characteristic lesions are sometimes absent. Further, in natural outbreaks, the disease rarely spreads from goats to cattle and buffaloes (Bawa, 1939). So far the only relatively efficient method of diagnosis of Rinderpest is by passage through goats, observations of thermal reaction, post-mortem lesions and finally confirmation by cross immunity tests. And therefore a study of some aspects of haematological changes in the blood of goats affected with rinderpest was undertaken to find out whether the blood picture would be an aid to the diagnosis of the disease.

It is well known that leucocytes are considered to be the motile defences of the body against infection. Some infections stimulate leucocytic production, of one particular type or other; others may depress the production of all types of cell or of one type more than the other. Leucopenia has been described as a characteristic symptom in many virus diseases of domestic animals, e.g., Hoḡ Cholera—Dinwiddie (1914) confirmed by Lewis and Shope (1929) and Kernkamp (1939); Feline enteritis—Hammon and Enders (1929); Agranulocytosis of cat—Wayne (1947); Ferret Distemper, prior to visible clinical symptoms—Kirk and Collins (1945). It has been proved beyond doubt that the virus of rinderpest while circulating in the blood is contained in or closely attached to the white cells. Robey and Hale (1946) in a study of morphological changes in the blood of young cattle during rinderpest describe the occurrence of a sudden, pronounced and prolonged leucopenia, beginning with a significant rise in body temperature. They further state that a distinct diaphasic fluctuation of the white cell count is noticed in each case, with an initial fall followed by an increase which finally ends in yet another drop in numbers. There is also a marked shift to the left in neutrophiles, with the sudden decrease in numbers.

In the present work, young local-bred goats (1½-2 years) of both sexes employed in Rinderpest Goat Tissue Virus production at the Veterinary Research Station Lucknow, were used. The animals were purchased locally and their state of health was observed by taking daily morning and evening

temperatures. Any goat showing irregular temperature prior to inoculation of the virus was discarded. Determinations were made previous to the injection of virus and on subsequent days till the slaughter of the goat for supply of Goat Tissue Vaccine to the field. As the goats had to be slaughtered on the 5th day following the inoculation of the virus, the major part of the present data has its limitations up to 5th day. However, whenever possible, cases were observed either up to death or till complete recovery.

METHODS OF PROCEDURE

(a) *Obtaining Blood*:—Blood was obtained from the jugular veins, under aseptic precautions, by means of a 20-gauge needle and a 2 c.c. record syringe, using both veins alternately.

After drawing about 2 c.c. of blood from jugular vein, a few drops were transferred to two clean slides for differential count and the rest was used for erythrocyte counts and haemoglobin estimation.

Double Neubauer counting-chamber was used for erythrocyte and leucocyte counts. Haemoglobin estimations were carried out on Sahli-Adams pattern of haemoglobinometer.

The blood smears were stained with Leishman stain and ordinarily 100 leucocytes were classified as Neutrophils, Lymphocytes, Monocytes, Eosinophiles and Basophiles. In case the total W.B.C. count was above 10,000 per c.mm. result was based on the classification of 200 or 300 cells.

(b) *Method of Recording*:—The figures have been recorded in absolute numbers. The 'Shiftograph' idea was adopted from Crocker and Valentine, which is the line used to follow various shifts to the left or right as based on Schilling Index—the number resulting from the division of non-segmented neutrophils by the segmented ones.

NORMAL HAEMATOLOGICAL VALUES IN GOAT

(Table showing comparative figures obtained by different workers)

No. Worker	Leucocytes Per c. mm.	Erythrocytes per c. mm. (Millions)	Haemoglobin Grams Per 100 ml.	Schilling Index
*1. Hayem	30,000	19.0	...	...
*2. Mohler & Washburn	9,200	9,976	...	...
*3. Storch	(12,057) (11,358)	14,567 10,150	...	...
*4. Warthin	8,000	16.0	...	...
*5. Malassez	...	18,000	...	...
*6. Sussford	...	9.0-10.0	...	...
7. Kolmer	5,000-14,000	9.0-19.0	12.7-14.2	...
8. Author	4,500-18,400	9.3-18.35	4.5- 8.5	0.03-0.11

* Note: The figures have been taken from S. H. Burnett.

Differential Count:

Leucocytes per c. mm.	Kolmer's figures	Author's Findings
Neutrophiles	2,100- 3,350	1,870- 8,670
Lymphocytes	2,100-11,250	2,115-12,144
Eosinophiles	1-100	55-2,310
Basophiles	0-600	0-276
Monocytes	50-600	0-810

DISCUSSION

From table I and II the occurrence of sudden, pronounced and prolonged leucopenia is evident. It begins with a significant rise in body temperature following the inoculation of Goat Tissue Virus in the experimental goats. In cases ending fatally the level of leucocytes never reaches normal while in surviving animals the level increases as the temperature falls. In one case the number reached above normal on the eleventh day but later it again fell to reach normal on about the fifteenth day. Analysis of the figures, however, revealed the increase due to rise in number of neutrophils. This points to the probability of secondary infection at this stage. A study of the differential count shows that lymphopenia is the most constant feature in all the cases while neutropenia is not constant. Schilling's 'Shift to the left' is always present, but is never so marked as has been noticed by Robey and Hale (1946) among rinderpest infected young cattle. Eosinophiles gradually decrease following the rise in temperature and may totally disappear from the peripheral circulation till the subsidence of the reaction. They seem to be of great prognostic value as in favourable cases they appear again and reach the normal level when the temperature falls, while in fatal cases they totally disappear never to appear again.

Table III represents those cases which presented less pronounced leucopenia or leucocytosis. On postmortem examination all of them revealed conditions from slight congestion to areas of consolidation in the lungs. An analysis of the figures indicates increase in number of neutrophils, the degree of increase directly corresponding to the severity of the lesion. On the other hand these complications have no influence on the lymphocytes and, therefore, lymphopenia still remains a prominent feature.

Table No. I

Case No.	Days	Temp. (°F)	Leuco-cytes.	Shiftograph	Differential Count					Remarks
					Baso	Eosino	Poly	Lympho	Mon	
1.	0	102.2	12,500							
	1	101.5	14,000							
	2	101.8	13,100							
	3	102.0	10,500							
	4	102.4	8,700							
	5	105.4	8,300							
	6	104.5	8,500							
	7	105.0	8,500							
	8	105.4	10,500							
	9	101.4	13,500							
	10	105.5	19,900							
	11	102.4	17,100							
	12	100.8	14,200							
	13	102.4	13,300							
	14	101.9	13,400							
2.	0	101.2	20,900							
	1	103.0	23,000							
	2	103.4	19,100							
	3	104.2	7,500							
3.	0	101.4	5,200							
	1	101.4	4,500							
	2	101.4	3,900							
	3	105.2	3,900							

TABLE No. II

Case No.	Days	Temp. (°F)	Leuco-cytes.	Shiftograph	Differential Count					Remarks
					Baso	Eosino	Poly	Lympho	Mon	
1.	0	101.4	14,250							
	1	101.0	14,400							
	2	103.4	9,200							
	3	106.0	5,850							
	4	105.2	6,250							
2.	0	100.2	12,200							
	1	102.0	10,650							
	2	104.4	9,750							
	3	105.4	5,950							
	4	104.4	8,250							
3.	0	100.4	10,500							
	1	101.4	11,500							
	2	103.0	11,500							
	3	103.0	5,000							
	4	104.4	4,700							
4.	0	99.0	14,500							
	1	101.2	20,200							
	2	102.4	12,500							
	3	103.4	9,000							
	4	104.9	7,300							

Case No.	Days	Temp. (°F)	Leuco-cytes.	Shiftograph	Differential count					Remarks
					Baso	Eosino	Poly	Lympho	Mon	
1.	0	100.6	16,000							
	1	99.2	17,300							
	2	101.2	16,500							
	3	106.2	5,400							
	4	106.6	6,400							
2.	0	101.6	13,800							
	1	100.8	14,800							
	2	101.6	10,500							
	3	102.4	10,500							
	4	102.2	7,800							
3.	0	100.6	11,600							
	1	103.4	11,800							
	2	104.4	7,000							
	3	104.4	66,900							
	4	105.0	65,800							
4.	0	101.6	13,800							
	1	101.8	19,600							
	2	103.4	8,500							
	3	104.0	5,700							
	4	104.4	5,000							

Table No. II (continued)

Case No.	Days	Temp. (°F)	Leuco-cytes.	Shiftograph	Differential count					Remarks
					Baso	Eosino	Poly	Lympho	Mon	
9.	0	102.8	22,400							
	1	101.6	26,500							
	2	101.4	8,600							
	3	103.4	10,000							
	4	105.2	7,000							
10.	0	101.6	14,800							
	1	101.4	15,200							
	2	101.4	13,000							
	3	103.2	7,600							
	4	104.4	8,000							
11.	0	100.2	15,900							
	1	104.0	15,700							
	2	103.2	14,600							
	3	100.0	4,500							
	4	101.6	4,000							
12.	0	102.0	9,000							
	1	100.5	8,500							
	2	102.4	4,800							
	3	104.0	2,000							
	4	103.0	2,600							

Case No.	Days	Temp. (°F)	Leuco-cytes.	Shiftograph	Differential count					Remarks
					Baso	Eosino	Poly	Lympho	Mon	
13.	0	101.2	11,900							
	1	100.0	10,400							
	2	102.6	5,600							
	3	103.8	8,200							
	4	103.8	7,400							
14.	0	101.8	13,500							
	1	100.4	10,500							
	2	102.0	5,000							
	3	103.2	4,500							
	4	104.8	7,500							
15.	0	102.6	22,400							
	1	102.0	27,300							
	2	101.8	13,800							
	3	104.8	12,400							
	4	103.8	8,600							
16.	0	102.8	16,100							
	1	102.6	15,800							
	2	103.2	13,600							
	3	106.0	7,300							
	4	104.2	10,300							

Case No.	Days	Temp. (°F)	Leuco-cytes.	Shiftograph	Differential count					Remarks
					Baso	Eosino	Poly	Lympho	Mon	
17.	0	101.8	18,100							
	1	102.6	20,000							
	2	103.4	19,700							
	3	104.0	16,400							
	4	106.4	5,500							
18.	0	101.0	14,500							
	1	101.0	12,300							
	2	101.0	12,000							
	3	101.6	12,100							
	4	103.8	9,400							
19.	0	101.6	14,400							
	1	104.8	4,600							
	2	102.0	2,200							
	3	105.2	6,200							
	4	105.2	6,200							

TABLE No. III

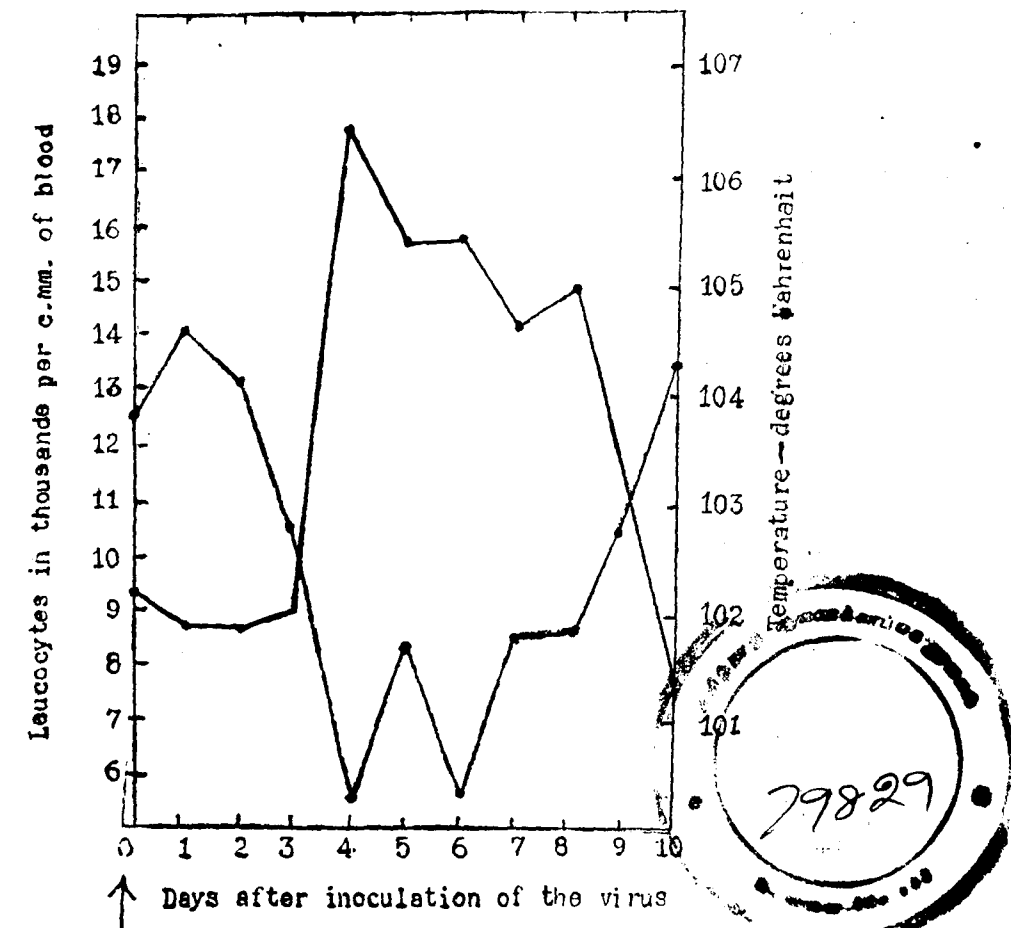
Case No.	Days	Temp. (°F)	Leuco- cytes	Shiftograph	Differential Count					Remarks
					Base	Eosino	Poly	Lympho	Mono	
1.	0	102.0	4,700		20	215	1,590	2,115	160	Lungs found highly congested in post-mortem.
	1	102.2	4,000		-	70	1,365	2,000	-	
	2	104.0	5,400		-	15	1,365	1,000	50	
	3	104.4	5,200		12	164	2,432	2,540	50	
	4	102.2	4,300		-	40	1,365	1,350	-	
2.	0	101.4	10,200		220	1,150	4,420	13,630	190	Pregnant. Lungs found congested.
	1	102.4	10,500		-	2,150	9,050	10,524	220	
	2	102.6	10,400		-	1,800	5,494	4,700	-	
	3	104.4	10,200		-	1,150	7,050	5,184	408	
	4	104.0	11,100		-	760	8,056	6,250	152	
3.	0	100.2	9,100		-	670	5,044	3,977	-	Lungs slightly congested.
	1	101.2	10,500		-	121	7,744	2,495	240	
	2	101.6	10,500		-	-	9,625	2,776	126	
	3	103.4	8,400		-	800	10,400	4,640	160	
	4	103.4	9,000		-	4	9,720	1,512	126	
4.	0	101.2	17,000		170	1,020	8,670	6,970	170	Lungs highly congested.
	1	101.6	18,800		-	276	11,280	6,708	376	
	2	101.6	13,100		-	208	7,859	2,442	255	
	3	104.6	10,400		-	208	7,859	1,976	260	
	4	103.6	15,500		-	69	15,465	1,705	310	

Case No.	Days	Temp. (°F)	Leuco- cytes	Shiftograph	Differential Count					Remarks
					Base	Eosino	Poly	Lympho	Mono	
5.	0	101.0	14,500		-	4,015	2,300	10,440	145	Lungs highly congested.
	1	101.4	21,100		-	844	6,641	13,715	-	
	2	101.0	12,500		-	620	6,118	5,770	-	
	3	107.4	10,600		-	106	6,118	4,376	106	
	4	107.0	8,100		-	-	6,118	2,082	-	
6.	0	101.2	15,400		184	300	9,704	12,154	-	Loose faeces.
	1	101.6	15,900		-	378	9,037	12,285	-	
	2	102.6	16,900		-	169	9,736	10,995	-	
	3	106.0	14,900		-	-	9,828	5,072	-	
	4	106.4	14,900		-	-	9,710	5,190	-	
7.	0	100.0	14,000		-	140	7,420	6,440	-	Died on 6th morning. Lungs found consolidated.
	1	101.0	14,500		-	236	6,256	7,956	-	
	2	101.6	14,700		-	351	9,017	5,332	-	
	3	101.4	14,100		-	-	7,110	6,990	-	
	4	101.4	14,100		-	-	12,690	1,410	141	
8.	0	101.2	10,500		-	50	7,725	2,730	-	Lungs found highly congested.
	1	101.6	10,500		-	500	5,000	5,000	-	
	2	101.6	10,500		-	249	4,316	5,935	80	
	3	104.4	10,500		-	-	7,357	3,143	-	
	4	105.4	10,500		-	-	10,440	1,060	-	

Case No.	Days	Temp. (°F)	Leuco- cytes	Shiftograph	Differential Count					Remarks
					Base	Eosino	Poly	Lympho	Mono	
9.	0	101.8	17,000		-	510	9,860	6,630	-	
	1	102.6	19,000		-	570	580	10,440	7,600	
	2	101.8	15,000		-	500	6,200	7,300	-	
	3	104.9	13,200		-	1,100	6,072	5,940	-	
	4	105.0	14,000		-	140	10,920	2,940	-	
10.	0	101.2	24,600		-	114	8,692	2,394	-	Died on 9th day. Lungs found congested.
	1	101.4	24,300		-	486	13,284	10,332	-	
	2	101.6	19,200		-	354	12,060	6,586	190	
	3	103.0	15,800		128	516	11,550	4,950	-	
	4	104.4	12,800		184	376	12,220	6,016	-	

Base = Basophiles per c.mm. of blood.
Eosino = Eosinophiles per c.mm. of blood.
Poly = Polymorph (Neutrophiles) per c.mm. of blood.
Lympho = Lymphocytes per c.mm. of blood.
Mono = Large monocytes per c.mm. of blood.
Leucocytes = Leucocytes per c.mm. of blood.
Days after inoculation of Goat Tissue Virus.

Leucocyte-temperature Relation During Rinderpest in a Goat



It has been noticed from observation on two cases that cases having pure and simple pulmonary inflammation without the infection of rinderpest present a very different blood picture. The blood picture in these cases is characterised by leucocytosis which is due to increase in number of neutrophiles. There is no evidence of lymphopenia. A case of simple diarrhoea did not present any characteristic change in the number of leucocytes.

CONCLUSIONS

1. Uncomplicated rinderpest in goats is characterised by a marked leucopenia particularly due to decrease in number of lymphocytes, beginning

on the third or fourth day after the injection of the virus and persisting for about a week in those animals which survive or upto death in fatal cases. The decrease in white cells appears with the rise in body temperature and prior to the appearance of visible clinical symptoms. There also appears a 'Shift to the left' in neutrophils with the sudden decrease in numbers.

2. In cases with respiratory complications, neutrophils greatly increase in number, which may account for actual leucocytosis or less pronounced leucopenia. In these cases lymphopenia is always a constant feature.

3. Eosinophils serve as a guide to prognosis. In favourable cases they soon reappear in the circulation while in fatal cases they remain completely absent.

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References

1. Bawa, H.S. : Rinderpest in Sheep and Goats in Ajmer-Merwara : *Ind. J. Vet. Sci. & A.H.* Vol. X part I (March, 1942) page 104.
2. Burnett, S.H. : The Clinical pathology of the Blood of Domestic Animals : Ed. 1908 Page 45.
3. Crocker, W.J. Hemography in Diagnosis. Prognosis and treatment based on 6,000 Schilling hemograms : *J. Lab. and Clin. Med.* 20 (1934) : page 172-192.
4. Dinwiddie, R.R. : Studies on the Hematology of normal and Cholera infected Hogs : *Arkansas Agric. Exper. Sta. Bull.*, 120 (1914) : page 41.
5. Gaiger, S.H. and Davies, G.O. : *Vet. Pathology and Bacteriology* Ed. 1938 : page 442.

6. Hammon, W.D. A virus Disease of Cats, principally characterised by leucoeytosis, and Enders, J.F. : enteric lesions and the presence of Intranuclear Inclusion bodies ; *J. Exptl. Med.*, 69 (1939) : 327-351.
7. Kernkamp, H.C.H. : The Blood Picture in Hog Cholera : *J. A.V.M.A* (November, 1939) : 525-529.
8. Kirk, R.J. and Collins, H.C. : The occurrence of Leucopenia preceding Visual clinical symptoms in Ferret Distemper ; *Canad. J. Exptl. Med.*, 9 (March 45) : 123-125.
9. Kolmer, J.A. : *Approved Laboratory Technic* : Ed. 1945 : 52.
10. Lewis, P.A. and Shope, R.E. : The study of the cells of the Blood as an aid to Diagnosis of Hog Cholera ; *J. A.V.M.A.* ; 74 (1929) : 145-153.
11. Robey, T.O. and Hale, M.W. : Morphological changes in the Blood of Young Cattle during Rinderpest and after Vaccination with attenuated Virus vaccine : *A.J.V. Res.*, Vol. VII, 23, (April, 46) : 222-227.

CONTROL OF ACUTE THEILERIASIS IN CALVES IN THE PUNJAB.*

BY

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In May 1940, we were called to attend a severe outbreak of acute theileriasis in calves of less than three months in age on a farm in the Multan district. On previous occasions the malady was recognised to have caused heavy death among calves on the farm. Locally the disease is known as *kanpher ki bimari*, i.e. illness with marked swelling of the parotid glands. It is produced by an endoglobular parasite, provisionally identified as *Theileria annulata*. The disease is prevalent from March to September, and the rate of mortality from 1936 to 1939 ranged between 13 and 23 per cent. Up to June 1940, the rate had reached 10 per cent. Since the chemotherapy of theileriasis has not yet been developed to a satisfactory stage, it is merely intended in this article to deal with the control measures adopted in endeavouring to eradicate the disease. A brief description of the symptoms as well as post-mortem lesions is given so that methods of diagnosis may be more widely known.

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SYMPTOMS

The disease occurs in acute and in subacute forms. In the former, the characteristic symptoms are dullness, discharge from the eyes and nose, raised body temperature (103°F to 106°F), marked swelling of the parotid, suprascapular and precrural lymphatic glands (figs. 2 and 3), frothy salivation, constipation followed by diarrhoea, ulcerated gums (as a result of which the calves cannot suckle) and a subsequent shrouding of the teeth (fig. 1). About the third week, most of the calves die and in the remainder symptoms become subacute. In some fatal cases, respiratory troubles, such as bronchitis and catarrh of the lungs have been observed. In the subacute form, the above symptoms are milder. Ailing calves continue to suckle. The body temperature usually remains below 104°F. Faeces are soft and yellowish in colour. Visible mucous membranes are pale and anaemic. The eyelids and the surrounding regions are oedematous. Such cases with proper care and nursing, are likely to recover after four weeks from the onset of the disease.

It may be mentioned that gingivitis and stomatitis are the most severe complications and render the animals unable to suckle. This results in loss of condition and progressive emaciation, leading finally to death. Another and less common complication is pneumonia.

LESIONS

The condition of the carcass is poor, mucous membranes are pale and in the majority of cases subcutaneous tissues, including fat, are stained deep yellow. The gums are red and ulcerated and show a light-grey gangrenous deposit. There may be pneumonia. The pericardial fat is deep yellow and the heart muscle pale. The liver is soft and icteric, petechiated and greatly enlarged (fig. 6). The gall bladder is usually distended and contains coagulated bile of dark-green colour. The spleen is soft and much enlarged. The urinary bladder often contains yellow coloured urine. The abomasum shows characteristic ulcerations (fig. 5). It may be emphasised here that prognosis is favourable only in cases where the mouth lesions are not severe.

CONTROL MEASURES

Sen and Sreenivasan (1937) tried several drugs for the treatment of experimental cases of theileriasis in hill bulls. Of these, atebirin (Bayer) was the only one which cured as many as 55 to 57 per cent of infected cases, but they also noted that natural recovery took place to about the same extent. Since so far no drug treatment has proved satisfactory for this disease, an attempt was made to control the arthropod vector, viz. *Hyalomma aegyptium*, with which the farm was found to be extensively infested. It has been proved to our satisfaction by one of us (H.N.R.) that



Fig. 1. Natural case. Extensive proliferation of gums and shrouding of the teeth.

Fig. 2. Enlarged precrural glands.

Fig. 3. Natural case. Enlarged suprascapular gland.

(By the Courtesy of I. C. A. R.)



Fig. 6. Liver, enlarged and petechiated.



Fig. 4. A tick-proof paddock.



Fig. 5. Abomasum showing ulcerations.

N. B. Figs. 2, 5 and 6 are taken from a case in which the disease was transmitted hereditarily by the second generation adults of *Hyalomma aegyptium*, at the Imperial Veterinary Research Institute, H. ukieswar.

(By the Courtesy of I. C. A. R.)

this tick is responsible for transmitting acute theileriasis to young calves and that the infection is transmitted hereditarily only in the adult stage of the tick and not in the larval or nymphal stages. As found by Fotheringham and Lewis (1937), this is quite different from what has been experienced in *T. parva* infection.

The first object was to save the new-born calves. For this purpose, they were divided into two groups, viz., weaned at birth and unweaned. For the former, an area was rendered tick-proof by first digging up the earth to a depth of about 18 in. and then burning dry leaves and grass over the dug-up area. Subsequently, a moat about 9 in. wide and 6 in. deep surrounding the area was filled with water. Attendants were engaged exclusively for this tick-proof paddock. It was observed that calves, which were detained here for three months, were susceptible to infection when removed to an infected area, though none died. For the calves of the second group, more elaborate arrangements were made. Cows in advanced pregnancy were isolated from the main herd at a place about half-a-mile away. Before removing them to this segregation camp, all ticks on the animals were hand-picked, their tails and ears dipped in, and rest of the body sprayed every third day with an arsenical solution containing of soft soap 11 oz., liquid paraffin 1 lb. 2½ oz., sodium arsenite 1 lb. 1 oz. and water 50 gallons. Separate attendants and grazing pastures were arranged. There were also several calves which were weaned at birth, but were below two months in age. All these calves were dipped in the arsenical solution using a Cooper's portable swim-bath and housed in a paddock at some distance from the main farm. Dipping was done every third day as before. A few of these calves developed the disease, but at the first appearance of symptoms there were returned to the sick ward where they were given symptomatic treatment along with good nursing. The floor of the sick ward was covered with hay bedding about 4 to 6 in. thick, to afford comfort and at the same time to prevent them from licking the earth.

Control by vaccination.—In 1940, one of us (H.N.R.) observed that the introduction of the dead parasites rendered healthy animals immune to subsequent inoculation of virulent blood containing Koch's bodies. In the light of this observation, a vaccine was prepared by making a suspension in 5 per cent formalin of lymph glands and spleen from a heavily infected case on the farm. Soon after birth, calves were vaccinated subcutaneously with a 5 c.c. of this vaccine and kept in the tick-free paddock for 14 days before being transferred to the tick-infested area. Between May 23 and June 13, 1940, 19 calves (7 females and 12 males) were treated in this manner. Of these, 16 were transferred to the tick-infested area—the remaining three, being born of heavy milkers, were detained in the tick-free paddock. Some of the calves, 14-21 days after being liberated in the tick-infested

area, showed a rise of body temperature, but none of them died. As a control experiment, seven calves born from June 13 and July 7, 1940, were liberated into the tick-infested area within six to twenty five days of birth. Of these, four escaped infection and three died of acute theileriasis. In August 1940, seven calves were inoculated with a dose of 10 c. c. of the vaccine instead of 5 c. c. Five males from this batch were removed to tick-infested area, after the prescribed period, and none of these calves showed signs of the disease.

These observations on vaccination are suggestive and encouraging but, since no strict laboratory tests, such as the injection of vaccinated calves with virulent blood, have yet been made, we refrain from drawing conclusions from these few field tests.

In conclusion, we would like to stress the value of adopting tick control measures on farms where outbreaks of acute theileriasis are common amongst calves. The information so far obtained from this farm indicates that since the adoption of tick control measures, no further cases of theileriasis have been detected.

'Carrier' in theileriasis.—A number of cattle in this farm showed parasites in the peripheral circulation without exhibiting clinical symptoms. Two experiments were performed on the farm to test the infectivity of 'carrier' blood to young calves of susceptible age. The results were negative. These experiments prove that the endoglobular forms of the parasite, as met with in carrier blood, represents the gametocytes and as such undergo no further development in the vertebrate host. So that development may proceed to the sporogonic part of the life cycle they must enter an intermediate host—chiefly an arthropod. Evidently, however, carrier animals are potential sources of infection to clean *H. aegyptium*. These observations further stress the importance of tick control measures.

Summary

Methods adopted for the control of acute theileriasis in calves due to *Theileria annulata* are described.

Calves less than three months of age were the most susceptible, mortality rate among such calves between 1936 and 1939 ranging from 13 to 23 per cent. The vector of the disease is tick, *Hyalomma aegyptium*.

Control measures consisted in keeping calves weaned at birth in tick-proof paddocks for at least three months.

The liberal use of tick-dip was practised both for young calves and their mothers in order to keep down the number of ticks in the farm.

Acknowledgements

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References

- Fotheringham, W and Lewis, E. A. (1937). Parasitology 29, 504.
Sen, S. K. and Sreenivasan, M. K. (1937). Indian J. Vet. Sci, 7, 16.

D.D.T. AND ITS TICKICIDAL VALUE ON DOGS

BY

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D. D. T. (Dichloro-diphenyl. Trichlorethane) has been introduced in the market as a product of high insecticidal power. Eminent workers in Europe and America have tested it in the laboratory and the field for years and have reported favourably in the control of insect pests without ill effects on agriculture, human beings, poultry, fish and domestic animals. Burt (1945) has shown its effectiveness in killing ticks under laboratory conditions. Buxton (1945) says that it retains its toxicity for over fairly long periods. In view of these the possibility of its use as a practical acaricide on dogs and thereby reducing the chances of canine Piroplasmosis and other tick borne diseases, a series of small scale trials were conducted at the Lucknow Research Station of the Animal Husbandry Department.

Historical.—The chemical—a white crystalline powder—was first synthesised in 1874 by Zeidler a German Chemist in Strassburg but it was only in 1939 that its remarkable insecticidal properties were discovered by Muller—a Research Scholar of the Swiss Dye Stuffs firm of Geigy of Basle. In 1941 Geigy firm informed its branch in United States of America about this new insecticide.

In 1942 the abbreviation—G. N. B. (Gesarol-Neocid-Base) was used for this active Principle and the Ministry of supply of Great Britain who had been informed earlier about its importance, devised the abbreviation D. D. T. for the compound in 1943. Before the discovery and introduction of D. D. T. Pyrethrum was the best insecticide and in 1942 when 70% of all pyrethrum was grown in countries under Japanese occupation, the allies fell short of insecticides. It was then that large scale production was ordered by various war departments.

During war D.D.T. was first used on a large scale in combating the vectors of typhus epidemic at the end of 1943. Subsequently D.D.T. found wider applications in fighting Vectors of Malaria—mosquito and its larvae. It was due to the large scale measures adopted by the allied armies in the recent World War II that millions of civilian and active servicemen were saved from disaster.

Material and methods.—Experimental subjects used in these trials were mongrel dogs about 2-3 years of age and heavily infested with ticks.

D. D. T. brands studied were

1. Neocid (10%) Geigy D. D. T. Powder
2. Atom Brand 10% D.D.T. powder
3. Alembic D.D.T., 5 % solution in kerosene oil
4. D. D. T. powder (probably practically pure. Kindly supplied by the officer-in-charge, hides and skin, Imperial Veterinary Research Institute).

The preparations of D.D.T. employed were classified as follows :—

1. *Emulsions.* These were prepared in kerosene oil using liquid soap solution as an emulsifying agent. Final D. D. T. concentrations tried were 0.3, 0.5, 1.0, 2.0, 3.0 and 4.0% for use as sprays as this method has largely superseded dipping.

2. *Ointment.* These were prepared with vaseline as base in final concentrations of 0.3, 0.5, 1.0, 2.0, 3.0 and 4% D.D.T.

3. *Powders.* Dusting powders were prepared with ordinary talc or starch in final D.D.T. concentrations of 0.3, 0.5, 1.0, 2.0 and 4 %. This method permits of very little risk of absorption.

4. *Oily dressings.* D. D. T. powders were mixed with sterile liquid paraffin (B.P.) to contain final D.D.T. concentration of 1.0, 2.0, 3.0, 4.0 6.0 and 7.6%.

Experimental details.—Experimental dogs were examined for the degree of tick infestation and also for evidence of other diseases prior to application of the medicament. For a single concentration of each preparation dogs with as equal infestation as possible were grouped and generally one dog served as control. Tick infestation was marked and heavy on ears, groins, back, axillae in the order of sequence in all cases.

Emulsions were used in the form of sprays over the dogs with the common flit pump in quantities of 100-200 c.c. at about 10-12 lb. pressure, the dog being held by a masked attendant.

Application of the ointment was by rubbing thoroughly into the hair.

Oily dressings were applied by rubbing in 100-200 c.c. of the preparation.

Powders were dusted well into the scalp ; about 2 oz of the powder were used.

In all cases the subjects were controlled for about an hour to minimise waste of medicament, dilution and to allow a fair degree of contact with the parasites.

Observations were recorded at intervals of 6—10 minutes and $\frac{1}{2}$, 1 $\frac{1}{2}$, 2, 3, 21, 26, 43, 67, 93 and 141 hours after application for

1. Repellent effect and
2. Toxic effects as recorded by
 - (a) Dead ticks attached to the host
 - (b) Live ticks attached to the host
 - (c) Effect on the experimental subject
 - (d) Not liable to tick infestation
 - (e) Residual effect of the drug.

Effectiveness is gauged by the viability of ticks remaining on the host, the best criteria being death and disappearance. Facilities for intensive watch of individual ticks on and away from the dogs was limited for any length of time. Care was, however, taken that after the application of the preparation, for at least an hour, the patient did not come in contact with dust, dirt or rub off the dressing. At times only single dog had to be used for a single concentration as sufficient number of comparably infested dogs could not be procured.

Incidentally some ticks that got detached from the host-spray and powder group—were collected and watched in the laboratory. These showed excitement to begin with, later tremors, dorsal position—difficulty to assume the natural ventral position—inco-ordination of the distal limb and paralysis. Some flies present on the host died in about 10-15 minutes time and reinfestation was noticed after about seven days.

Results.—The action of the drug is slow and persists for about 2-2½ weeks. D.D.T. appears to be both a stomach and nerve poison characterised by a short period of excitement, tremors, dorsale position which is much pronounced, inco-ordination followed by progressive paralysis and death.

(a) *Emulsions.*—Emulsion sprays containing final D. D. T. concentration less than 2% did not give any promising results. Above this they were highly fatal to ticks in as much as the dogs were clean with 4% D. D. T. in about 3 hours. With these concentrations 1½—2 hours was the shortest period during which ticks were noticed to die and the dogs became clean in about 43 hours. Residual effect of 3% (Alembic brand) and 4% (M. brand) D. D. T. persisted upto 13 days. Accidentally 0.5% D. D. T. emulsion spray gained access to the eye of an attendant holding the dog. Except slight mechanical irritation for a day, no other untoward reaction was noticed till date of this paper.

(b) *Ointment.*—D. D. T. ointments less than 1% strong had no effect on dog ticks. At higher concentrations the ticks began dying at 3 hours and onwards and the degree of effectiveness was noted as under.

1 % Atom brand	dogs clean at	141 hours.
2 % " "	" " at	93 hours.
3 % Neocid brand	" " at	67 hours.
4 % " "	" " at	43 hours.

Residual effect of 1 and 2 % continued up to 17 days whilst of 4% up to a 13 day period of observation with no fresh infestation though the surroundings were swarming with ticks. With an ointment it is possible the spiracles may be blocked and ticks may be asphyxiated and die.

(c) *Dry powder.*—0.3 and 0.5 % Atom brand powders were not of any tickicidal value. With 1 and 2 of the same brand the effect was marked in about 10-15 minutes as evidenced by the excitement and parading of ticks. In about 141 hours, with 1% powder, the dogs were clean and the effect was seen to persist for 17 days. Results were much better with 2 % (Atom or Neocid) and 4 % Neocid brands as very few live ticks were seen attached after 21 hours. Residual effect of 4 % Neocid D. D. T. continued up to a 13 day period of observation.

(d) *Oily dressing.*—With less than 3 % (Neocid brand) D. D. T. only 20-25 % of ticks were got rid off in 43 hours. Concentrations over this gave the following observations.

3 %	— in 21 hours	mortality	50 % approximately
4 %	— in 43 "	"	100 "
4 %	— in 3 hours	"	80 "
	43 hours	"	100 "
6 %	— in 3 hours	"	90 "
	21 hours	"	100 "
7 %	practically same as 6 %		

The percentage computation made is the average records of three independant observers. The dogs remained clean, inspite of the infested surroundings for 13 days in case of 3 and 4% and 7 days in case of 6 and 7% when the experiments were concluded.

At the end of various trials the control dogs were still infested to about the same degree without any appreciable reduction in the number of ticks. Probably these were fresh infestations pointing to the receptiveness of the untreated hosts. Different concentrations of the preparations in single application tried did not prove toxic either to the dog or to the attendant.

Discussion.—From a perusal of the literature Soni (1946) suggests that 0.3 and 0.5 per cent D.D.T. emulsion is fatal to cattle ticks within a few minutes. Heath and Mitchell (1946) tried emulsions ranging from 0.1- 2.0% as anti-sheep tick dips but the results were so variable as not to allow formulation of specific recommendations. Gouck and Smith (1944) reported that a 5% emulsion as a wash or a 10% dust was effective in controlling brown dog tick and lone star tick infestations and even ten days after treatment the residue was a mass of dead ticks only. A dust containing 5 % of D.D.T. Neocid was found ineffective by Mathysse (1945) for control of sheep keds (*Melophagus ovinus*) as the mortality was only 7 %. As an acaricide in rats infested with ticks (*Notoedris muris*) D. D. T. in 1 % solution in liquid paraffin was comparatively ineffective (Taylor 1945) as compared with Benzene Hydrochlor (666). Buxton (1945) pointed out that D.D.T. has little effect on mite infestation and that ticks require high doses. Warren (1945) has reported the residual effect of D.D.T. on birds to be round about 2-3 weeks which is somewhat corroborated by these trials of ours and so far, the fact that ticks die within a few minutes with 0.3 to 0.5 % emulsions in kerosene oil and liquid soap solution could not be established. Surgent (1945) has pointed that application of 180 c.c. of the 5% D. D. T. solution gave good protection for 18 days during which time only one tick became attached in dog. Even the makers,

Geigy firm say the action of D.D.T. is slow and it may take insects from a few hours to 3 or 4 days, to die according to species and amount absorbed. The results should not be judged before a few days after application. For complete inhibition of egg laying in *Boophilus decolourates*, Whitnell (1947) has suggested a 4% D. D. T. The action is slow and fairly persistent and the dogs became clean of live ticks in 43 hours with concentrations above 2 %. The ointment does not warrant sufficient effectiveness, for a longer time was needed, (67 hours) even with a 4% concentration. It is just possible that this partial in-effectiveness was due to dilution with earth and dust the animal got access to later. Thus ointmental preparations are not commended for general use due to the sticky nature, chances of dilution and the dogs not presenting a comfortable appearance to the aesthetic sense. 5% D.D.T. paste was successfully used against gulf coast tick and spinose ear tick with protection upto 3 weeks (Reedal and Smith, 1944). Powders though clean and are easy of application are disadvantageous in that the animal could get rid off the dressing by a good shake. With this form the ticks got excited soon and began roaming about leaving the host. Oily dressings possess the disadvantages to some extent as those of ointments and are not favoured. Insects survive its (D.D.T.) effects for 24 hours or more (Frolicher 1944) before dying.

In spite of the fact that more experiments may still be necessary before definite conclusions could be formulated, yet there is evidence that D.D.T. is a safe insecticide in the strengths and frequencies we have employed and that emulsions as aqueous suspension used as sprays are the best method of application. A suitable effective application whose residual effect lasts upto 2 weeks is a 4% D. D. T. emulsion in kerosene oil and liquid soap solution. Low concentration of D.D.T. has no deleterious effect on the eye (Domeujoz quoted by Geigy firm).

Summary and conclusion.

(1) D.D.T. is definitely lethal to dog ticks in concentration over 1% and is a slow knock down and a sure kill. Of the products used, the aqueous suspension and dusts in the order named, if properly used, constitute the safe ones for use on dogs for cleanliness and efficiency.

2. Best concentration of D.D.T. is a 4% emulsion in kerosene oil and liquid soap solution.

3. The residual effect lasts upto 2 weeks.

4. D.D.T. is non-toxic to the patient and the worker in the strengths and frequencies we have studied.

SPRAY (KEROSENE OIL AND SOAP SOLUTION)

DDT product and its strength	No. of dogs	Tick infestation	After 6-10 minutes	1 1/2 hours	3 Hours	21 Hours	26 Hrs	43 Hours	67 Hours	93 Hours	141 Hrs.	Residual effect
A. 0.3%	2	heavy	Numerous	Numerous	Numerous	Numerous	Nu.	Numerous	Numerous	Numerous	Numerous	..
A. 0.5 "	2	"	"	"	"	"	"	"	72 hrs one died of diarrhoea	120 hours died of pneumonia	..	..
A. 1.0 "	1	"	Tick falling still falling	A few dead & attached	Nearly 10% dead & attached	Nearly 80% alive & attached	as ab	as above	as above	as above 96 hours ran away	..	..
M. 1.0 "	1	"	Numerous Tick getting detached	As above	Tick falling easily attached	Nearly 60% alive & attached	as ab	50% alive & attached	as above	Used in another expt.	..	..
A. 2.0 "	1	"	Tick falling As above	Few dead & attached	20% dead & attached	40% alive and attached	as ab	Died of pneumonia	..	..	..	..
M. 2.0 "	2	"	"	"	40% dead & attached	60% dead & attached	as ab	80% absent & dead	as above	Used in another expt.	..	..
A. 3.0 "	1	Moderate	Numerous	Plenty fell down	Plenty getting detached	80% absent & dead	5% alive	A few alive	..	..	13 days	..
M. 4.0 "	2	"	"	Plenty getting detached	Plenty dead & attached	All died	All died	All died	All died	All died	All died	13 days

A = Alembic; M = Mukteswar;

OINTMENT (VASELINE)

Atom Brand	No. of dogs used	Tick infestation	After 6-10 minutes	1-2 hours	3 hours	21 hours	26 hours	43 hours	67 hours	93 hours	141 hours	Residual effect
0.3 %	2	Heavy	Numerous	Numerous	Nu.	Nu.	Nu.	Nu.	Nu.	Nu.	Nu.	...
0.5 "	2	"	"	"	"	"	"	"	"	"	"	...
1.0 "	2	"	"	"	Few dead & attached	80% alive	as above	20% alive & attached	5% alive	A few alive	All died	17 days
M.1.0.,	1	"	"	"	Tick falling, falling, & attached	Still falling	About 5% absent.	80% alive as above	Used in another Ex	Used in another Ex	...	...
2.0 "	2	"	"	"	40% dead & attached	60 dead & attached	as above	5% alive	A few alive	All dead	...	...
M.2.0.,	1	"	"	"	25% dead & attached	40% dead & attached	"	20% alive & attached as above	Used in another Ex	Used in another Ex	...	17 days
Neocid												...
3.0 "	1	Moderate	"	"	40% dead & attached	60% dead	"	5% alive	All died	All died	All died	dead
N.4.0.,	1	"	"	"	60% dead & attached	80% dead	"	All died	"	"	"	13 days

POWDER (STARCH)

Atom.	No. of dogs used	Tick infestation	After 6-10 minutes	1/2 an hour	1 1/2-2 hours	3 hours	21 hours	26 hours	43 hours	67 hours	93 hours	141 hours	Residual effect
0.3 %	2	Heavy	Numerous	Numerous	Numerous	Numerous	Numerous	Numerous	Numerous	Numerous	Numerous	Numerous	Numerous
0.5 "	2	"	"	"	"	"	"	"	"	"	"	"	"
1.0 "	2	"	Ticks fell down	Ticks fell down	Plenty fell down	Plenty fell down	20% fell down	20% fell down	60% alive & attached	20% alive & attached	Nearly absent	All absent	17 days
2.0 "	2	"	"	"	20% absent	90% fell down	1 dog ran away	Nearly absent	1-2% alive & attached	dog died	...	...	...
N.2.0 "	1	"	"	"	40% fell down	Nearly all fell down	Nearly all fell down	A few alive & attached	A few alive & attached	Used in ano. expt	...	...	...
N.4.0 "	1	Moderate	"	"	80% fell down	Nearly down	A few alive	All fell down	All fell down	All fell down	All fell down	All fell down	13 days

N = Neocid ;

DRESSING (LIQ-PARAFFIN)

No. of dogs used	Neocid	Tick infestation	After 6-10 minutes	1/2 an hour	1 hr. 3 hours	2 1/2 hours	26 hours	43 hours	67 hours	93 hours	141 hours	Residual effect
1	1.0 %	Heavy	Numerous	Numerous	Numerous	Tick falling	10% dead & attached	20% dead & attached	20% dead & attached	Used in another expt	All dead	13 days
1	2.0 "	"	"	"	"	"	Tick falling	Nearly 25% dead & absent	Nearly 25% dead & absent	"	"	"
1	3.0 "	"	"	"	"	"	"	Nearly 25% dead & absent	"	"	"	"
1	4.0 "	"	"	"	"	Nearly 50 died	A few alive	All dead	All dead	"	"	"
1	6.0 "	"	"	"	"	80% dead & attached	"	"	"	"	"	"
1	7.0 "	"	"	"	"	Nearly 90% dead	All Dead	"	"	"	"	7 days
		"	"	"	"	Nearly all dead	"	"	"	"	"	7 days

Acknowledgement:—We wish to place on record our deep gratitude to Sir Frank Ware, Messrs. T.J. Egan and T.S. Davies for their interest and guidance during the investigation. Our thanks are also due to the Health Officer, Lucknow Municipality. The Technical Assistance rendered by Mr. Ashad Hussain is gratefully acknowledged.

References

- Burt E.T. 1945. *Ann. App. Biol.* 32.3.
 Buxton P. A. 1945 *Tra. Roy. Soc. Trop. Med. Hyg.* 38.367-393
 Froelicher 1944. *Vet. Rec.* 58. 43. 465
 Gouck H.K. and Smith C.N. 1944. *J. Eco. Entomol* 37. (1) 130
 Heath G.B.S. and Mitchell J. G 1946 *Vet. J* 102. 5. 130-137
 Mathysae J. G. 1945. *J. Eco. Entomol* 38. 285-290
 Reedal C.S. Smith C.L. 1944. *Idid.* 37. (1) 132
 Sargent Ed, Donaties A and Parrot L. 1945. *Arch. Inst Pasteur Alex.* 23. 249 *Vet. Bull.* 17. 159. 1947.
 Soni B.N. 1946 *Ind. Farming.*
 Taylor E.L. 1945 *Vet. Rec.* 57. 210-211.
 Warren D.C. 1945. *Poul. Sci.* 24. 473-476.
 Whitnell A.B.M. 1947. *Vet. Rec.* 59. p. 28.

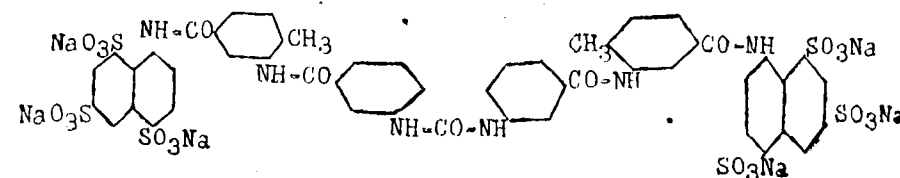
SURAMIN IN VETERINARY PRACTICE—IDENTITY OF BAYER 205 WITH SURAMIN B.P.

CONTRIBUTED BY

DR. J. M. MUNGRAVIN, M.B., B.Ch., M.R.C.S., L.R.C.P.

The discovery and development of the extremely important trypanocide, Bayer 205, was an achievement of outstanding importance and merit for which German workers were entitled to reap an appropriate reward. Nevertheless they were very reluctant to reveal the precise chemical structure of Bayer 205, and from the enquiries that are received from time to time it is evident that many users are still in doubt as to its precise composition.

Bayer 205 is a complex substance, the structure of which is not possible to prove by normal chemical and physical methods, and previously there has been no exact evidence of its structure. As a result of the synthesis and biological examination of a large number of complex ureas, the French Workers Fourneau, Trefouel, Trefouel and Vallee (*Comptes rendues*, 178, 675, and *Ann. Inst. Pasteur* 38, 81) concluded that Bayer 205 was almost certainly identical with their substance Fourneau No. 309, which has the following structure:—



In 1928, Bauer and Becker (Chem. Zentralblatt, 1922, I 2970) of the Georg-Speyer-Haus in Germany did reveal a constitution for Bayer 205, identical with that deduced by Fournieu, but as the Germans never challenged the validity of the Poulenc Freres patent for the manufacture of Fournieu 309, on the grounds of prior manufacture, doubt as to the constitution of Bayer 205 still remained.

Nevertheless, as Fournieu's evidence appeared sufficiently conclusive, it was a compound of the structure of Fournieu 309, which British workers set out to manufacture in 1934 and sell as "Antrypol", and which is now described in the British Pharmacopoeia as Suramin.

All doubts as to the complete identity of Bayer 205 (also marketed as Germanin and as Nağanol) with Suramin B.P. have finally been dispelled by an examination of the actual German manufacturing process, which is precisely on the lines indicated in the British Pharmacopoeia monograph. The German manufacturing process was obtained during a B.I.O.S. Mission, and is deposited with the Foreign Documents Unit Library, Lansdowne House, Berkeley Square, W. I, with the file number F. D. 20/46, I-G Farben A. G. Elberfeld, Pharmaceuticals, process No. 59.

It can now be said quite definitely, therefore, that the following are identical—the German products Bayer 205, Germanin, and Nağanol, the French Product Fournieu 309, the British products "Antrypol" and Suramin B.P., and the American product "Naphuride Sodium".

"Taking the important subject of Animal Physiology as an example of the present position, I found that the major investigational work in this subject at Cornell is carried out in the College of Agriculture and not in the College of Veterinary Medicine, and until this position is reversed veterinary graduates, as a whole, will not be endowed with that outlook which would make it an axiom that they would be the first choice when investigational or development work of any kind connected with the domestic animals is contemplated. I once heard the late Sir Arnold Theiler at an important Conference propounded this maxim, which was received with the greatest approbation by all present, friend and foe alike, but I have sometimes thought that he might have added that it is up to the veterinary profession to see that, before making this demand, the curriculum at the teaching institutions is arranged so that there can be no question of the superiority of the veterinary graduate in all matters relating to the domestic animals. This, unfortunately, is not always the case at present."

Sir Frank Ware.

Veterinary Record, July 19, 1947.

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Editorial

OUR FREEDOM.

"The Appointed Day has come—the Day appointed by Destiny—and India stands forth again after long slumber and struggle—awake, vital free and independent." "We are a free and sovereign people today and we have rid ourselves of the burden of the past. We look at the world with clear and friendly eyes and at the future with faith and confidence"

PANDIT JAWAHARLAL NEHRU.

At last the Deliverance has come. And India, dear old India, has become Free and Independent. The 15th of August 1947 will go down to posterity as the Day of Independence for our beloved Mother-land. By the Grace of the Almighty, this Independence has been attained in a way unparalleled in the history of the world: and, although credit must be given to the statesmanship of Great Britain in bowing to the inevitable with grace and dignity, the honours go to that purest and greatest living man of the world, a gift of India—Mahatma Gandhi—who with his band of selfless and noble followers conducted the fight for Independence not with arms and armaments, not with bombs and bombardments, nor again with crimes and cruelties but with that "matchless and unfailing weapon of Truth and Non-violence." To that greatest living

soul, to that band of brave patriots and stalwart sons of the land—we pay our homage in reverential regard, love and affection.

Thus ends the long period of British domination over India. In the midst of plenty, our people have been starving, owing to "the criminal neglect" of Agriculture and Livestock which has been, and, still, continues to be the main occupation of the vast millions of this country. To use the words of Mahatmaji, we have plenty of fertile land where we can grow fruits, vegetables and other foodstuffs. But we do not make full use of our opportunity..... God has given us everything we need and He has endowed us with intellect and the use of two hands. We can raise our food, grow cotton and prepare our own clothes, rear cattle and supply milk to our children. Yet we go hungry and naked. Our children are ill-fed and under-nourished. Could there be anything more tragic?" This tragic state of affairs must not be allowed to continue hereafter and a new chapter must henceforth open in the governance of the land. The duty of the Government from now on must be to correct these tragic conditions and our resolve for the future must be to this end. It is therefore heartening to hear Pandit Nehru, assuring us that our endeavour for the future should be to bring freedom and opportunity to the common man, to the peasants and workers of India. These people constitute the main strength of the country and they are to be found scattered in the neglected, in the criminally neglected 7 lakhs of Indian villages, eking out a miserable existence from the toil of the land. Unlike other countries, our country's economy is a cow-centred economy, and our downfall and degradation started from the day when that cow, the Mother of Prosperity, was ignored, ill-fed and ill-treated. To restore that cow to her traditional glory and power and economy, to rehabilitate the land and to assure us all with that precious freedom of all freedoms—freedom from want—these should be the prime concern of our Government. As Rajendra Prasad has said, in his broadcast on the Independence Day, "These (*i.e.*, Agriculture and the need to increase the milk supply in India) are so vital

to our existence." We have to think hard and labour hard if we are to increase our food production and improve our cattle and milk supply. In this, the Veterinary profession has got a vital part to play and we dedicate ourselves once again to this noble task with hope, faith and confidence in the gigantic work ahead of us. May God help us and guide us in this service to our revered Mother Land.

Animal Husbandry and Veterinary College,

Osmania University, Hyderabad Dn.

We are informed that the above Veterinary College started functioning from last year and that the syllabus of the course of studies is in accordance with the recommendations of the Veterinary Education Sub-Committee appointed sometime back by the Imperial Council of Agricultural Research. The teaching is done in Urdu, "which is the official language of the State". Naturally, the admissions are limited to the Urdu knowing candidates of the Osmania University who have Biology, Chemistry, Physics or Geology as their optional subjects. The course extends over four years and leads to the B.V.Sc., degree of the Osmania University. Mr. M. Habib Khan, M.R.C.V.S., F.Z.S. (Lond.), is the Principal of the College and we are sure that under his able guidance and stewardship, the institution will have a prosperous career and its *alumni* will go out into the world as shining lights of the Veterinary profession.

The imparting of higher Veterinary Education in the local languages in India is a new departure and is the first experiment of its kind in India. Its results will, therefore, be watched with great interest by everyone interested in the subject.

RETIREMENT

K. B. PILLAY, G.B.V.C., P.G.

(Contributed)

Mr. K. B. Pillay, Assistant, Director of Veterinary Services, in-charge Central Laboratory, Nagpur and Veterinary Investigation Officer, Central Provinces and Berar, Nagpur retired from service on the 6th January, 1947 after serving the province, for well over 33 years.

Born in the year 1890, in the Travancore State, Mr. Pillay graduated from the Bengal Veterinary College at the age of 24 and immediately took up service in the C.V.D., Central Provinces. An intelligent and capable Veterinary Assistant Surgeon, he was mostly kept in charge of the premier dispensaries in the province, such as Nagpur and Jubbulpore. After ten years service, he was promoted as a District Veterinary Inspector and later on to the rank of Assistant Director in Veterinary Service, Class II. He was the first person selected by the C.P. Government to undergo training in the advanced course of Animal Husbandry in 1941. On completion of the course, he was placed in-charge of the Central Veterinary Laboratory, Nagpur and in 1943 was placed in additional charge of the duties of the Disease Investigation Officer. He fulfilled the responsibilities of these double duties with his hard and sincere work till the date of his retirement.

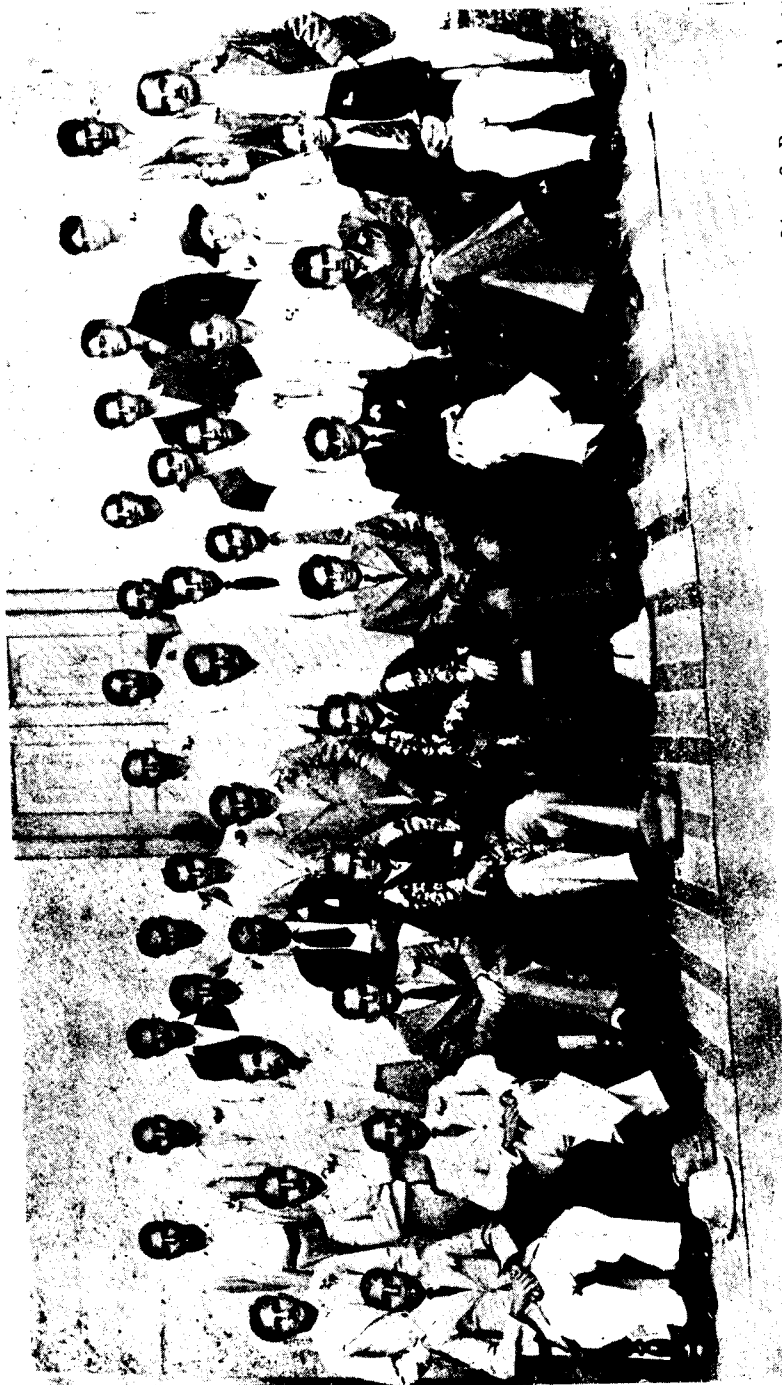
In the beginning of his service, Mr. Pillay got several better offers from other provinces, but he refused to accept them at the request of the then heads of the Veterinary Department. This evidently, goes to show the esteem he had gained from his superiors, even at the early career of his service.

By his retirement the department has lost a loyal, able and a sincere officer. He was liked by his superiors and was held in high esteem by his subordinates. He was very kind to



G. R. VISWANATHAN, G.M.V.C., P.G. (Edin.),
*Who has been appointed as Ag. Principal,
Madras Veterinary College.*

Group photo taken on the occasion of the Farewell Party to K. B. Pillay,
Retired Assistant Director of Veterinary Services, I/C Veterinary Laboratory, Nagpur,
by the Veterinary Staff of the Berar Division



Sitting:—Dr. G. J. Khond; Dr. E. S. Nair; Dr. E. Gopalan; Dr. P. S. Sundaram, A. D.; Dr. K. B. Pillay, Lieut. S. Ponnambalam;
Mr. S. P. Panikhar.; Dr. G. R. Ramaswamy; Dr. A. Karim.
Standing:—Dr. B. A. Joshi; Dr. P. N. Puranik; Dr. V. D. Deshpande; Dr. K. N. Katiyar; Dr. K. V. Deshmukh; Dr. B. B. Rajput;
Dr. N. M. Deshpande; Dr. M. A. Razak; Dr. D. D. Sheshao Rao; Dr. M. Ram Mohan Rao; Mr. D. P. Ketkar.
Standing:—Dr. Abdul Azeem; Dr. M. T. Kurkure; Dr. N. G. Kalgaonkar; Dr. P. R. Pathak; Dr. N. D. Bhawe; Dr. M. S. Gupte;
Dr. S. C. Ghosh; Dr. D. K. Damley; Dr. M. John; Dr. S. S. Venkatesan; Dr. S. A. Miyan; Dr. Y. T. Cadre; Dr. B.
R. Shindikar; Dr. Karandikar; Dr. Mutrajlou; Mr. Sheik Channoo.

his subordinates and his pleasing manners and cheerful disposition will remain ever green in the memories of all those who came in contact with him. The outstanding feature in him was the philosophical ideals which he brought in practice even in his official capacity.

May God give him long life to enjoy his hard earned rest!

APPOINTMENT

Sri G. R. VISWANATHAN, G.M.V.C., P.G., (Edin.)

We congratulate Sri G. R. Viswanathan, G.M.V.C., P.G. (Edin.), Lecturer in Pathology and Bacteriology, Madras Veterinary College, on his appointment as Acting Principal of the same College. We feel glad that in appointing him as the Principal the Government have recognised the good work done by him in various capacities.

We wish him success in his work.

LATE Mr. A. J. MACDONALD.

(Officer I/C Poultry Research Section, Izatnagar).
(An Appreciation)

We regret to learn the sad demise of Mr. A. J. Macdonald under tragic circumstances.

Mr. Macdonald was a public servant of a very high order. His devotion to duty and his high sense of responsibility have rarely been excelled. Those who had seen him personally weighing hundreds of little chicks every day individually and noting their progress, in the midst of his even more responsible items of work, could not but admire his patience, industry and

adherence to truthful data. Work was the one all-absorbing passion with him. Unmindful of his dress and personality, he would be attending even to the minutest details of farm work. We wonder how many of his students have imbibed that spirit!

Who could ever forget his valuable contributions on poultry industry in Indian Farming, Poultry Gazette, etc? His lucid and racy style with no room for any doubt, marked him out as one of the best exponents of matters connected with poultry and poultry industry.

Mr. Macdonald had a rough exterior which made him sometimes to be misunderstood. But he was just the same either with an Indian or an European. He had no courtesy to 'Non-doers'. We only hope the high standard of work which he so assiduously built at Izatnagar, is kept up.

We draw this pen-picture of that great worker with a purpose in view. India needs such workers amongst her sons. Let us emulate the best wherever we find them. All talk and no work is not the way to retain the Freedom we have won. Let us be efficient in every field of work.

We have lost an esteemed colleague. But his spirit lives to those who care to emulate!

We offer our condolences to Mrs. Macdonald and the children. May his soul rest in peace!

T. V. M.

Clinical Articles

GESTATION PERIODS OF COWS—A CASE OF WIDE RANGE IN A DAIRY COW.

BY

FRANCIS JOSEPH, G.M.V.C., P.G. (Mad.),
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AND

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AND

S. N. VAIDYANATHAN, G.M.V.C.,
(Addl.) *Asst. Lecturer, Agricultural College, Coimbatore.*

Fleming's Veterinary Obstetrics as revised by Craig (1930) contains on page 116 the following statement:—

"The average period of pregnancy in the cow is about nine months, or 39 to 40 weeks. In 1,062 observations the mean period was 283 days. Colin gives an average of 280 to 285 days. Dieterichs gives the shortest period as 210 days, the longest as 353 days, and the average as 286 days; while Baumeister and Rueff give the shortest as 240; the longest, 330 days; and the average, 285 days. The average of the Bernese Simmenthaler breeds at Hohenheim was 280 days; male calves, 283 days; and cow calves, 278 days. Earl Spencer after 760 observations, gives an average of 284 to 285 days. Gestation is usually longer for a male than a female calf, although in Earl Spencer's statistics the opposite held good. In the improved breeds generally the period is shortened".

Again on page 149 "Cases of abnormal retention of foetus have been observed in all domesticated animals, but most commonly in the cow. Saint-Cyr records 35 instances in the cow, 7 in the ewe, 5 in the mare and only one in the bitch. The length of time during which a foetus may be retained beyond the normal period varies from a few months to five years.

The causes assigned for this condition are those which prevent normal parturition..... The foetus may live for a certain time after the normal period provided the foetal membranes are not ruptured, and even increase in size. Cases of this kind have been noted up to 300 days in the cow, and in 2 cases 365 days. Most commonly the foetus dies at or near the time of first symptoms of parturition."

With these observations before us, we would like to record the following history of Cross-bred Cow No. 383 belonging to the Coimbatore Agricultural College Dairy. This cow was born on 14-10-34. It calved for the first time on 20-1-38 and, so far, has given birth to nine calves—one calf every year on an average. The first 8 calves—3 males and 5 heifers—were normal in every way, healthy and well, and these were born without difficulty. The ninth was a monster bull-calf which had to be extracted in a dead condition.

The period of gestation of the first eight calves (vide table) shows a wide range from 269 to 305 days, averaging 286 for the whole lot. The bull calves averaged 285 days, the heifer calves, 286.4 days. However, the longest and the shortest period of gestation have been in the bull calves only viz ; 305 and 269 days respectively.

The cow has held successfully to the first services in the case of the first seven calves, while the eighth calf appears to have been born to the second service, if we could exclude the longer gestation period calculated on the previous service.

The first 3 calves were sired by bull No. 73, the second 3 by bull No. 160, and the seventh calf by bull No. 61. Bull No. 102 was the sire for the eighth calf—2 services 25 days apart. For the ninth pregnancy, bull No. 238 was used.

This ninth pregnancy turned out to be an abnormal and interesting one. Firstly, the cow took the bull without any apparent ill effects while she was eight months advanced in calf. Secondly, the calf was carried long over-term. According to the service register, the period was 362 days and contributed a record approaching near to the period of 365 days mentioned in Fleming's Veterinary Obstetrics. Thirdly, dystokia was experienced by this animal for the first time in its life, in giving birth to the ninth calf. On the 362nd day of pregnancy, signs of parturition were noticed but the parturition did not proceed in the usual way. Trouble was suspected and examination revealed ruptured membranes, foetus dead, and unable to pass through the pelvis due to lateral deviation of the head with forelimbs folded at the knees. The fore-head showed the presence of teeth which abnormality suggested every possibility of a monstrosity within. This was a clear warning for careful manipulation in effecting the removal of the foetus. Correction of the deviation and delivery of the foetus by traction took about an hour mainly due to necessity of avoiding injury to the pelvic roof by the protruding teeth on the the fore-head of the monster.

After delivery, the cow was in need of attention for nearly 6 weeks when she was discharged cured. At the present moment she is in her tenth pregnancy, though she had to be served three times within five months.

On removal, the foetus was found over-sized and the writers believe that it must have continued to grow even after the average gestation period. The fact that there was still fluid within the membranes at the time of the manipulations suggests that the monster was living practically till the commencement of parturition and that the death must have been the result of dystokia.

Description of the Monster

On the middle of the monster's forehead, between the eyes, was a second lower jaw (the first two inches only) with the temporary incisors up. Above this was a freely moving piece of tongue-tip two inches long. This appendage was projecting out at an angle from the forehead rising to about an inch from the surrounding skin. This appears to be a simple monstrosity through excess in formation *Monocephalus dignatus* (incomplete).

Quoting Craig again (p : 289) on the frequency of monstrosities and their contribution to difficult parturition :

"Monstrosities are far from being rare in the domesticated animals, and among them are found most frequently in bovines.

Gurlt gives the following list of 740 monstrosities, showing the proportion in each species : cow 239, ewe 179, sow 87, bitch 78, cat 71, mare 56, goat 24, mule 3, ass 3. Saint-Cyr in 71 instances found 45 calves, 16 lambs and kids, 4 pigs, 4 kittens, 1 puppy, 1 foal. Baumeister and Rueff mention that in the King of Wurtemberg's private stud, of 2,340 foals produced, there were only 9 monstrosities. In the Hohenheim dairies, among the cows the monstrosities were only 1½ per cent, and among sheep 1 in 768 lambs.

Though monstrosities are not rare in animals yet all do not give rise to difficult parturition : for in some instances the deformity does not interfere at all with birth ; in others, in which the deformity is of a such a nature as would impede delivery, birth often occurs prematurely when the foetus or foetuses are small and soft ; while even when fully developed double and triple monstrosities have occasionally been born without assistance."

The writers are of opinion that the large size of the foetus and the well developed abnormal head could have by themselves caused dystokia although actually there were other deviations to account for this.

TABLE

Cross-Bred Cow No. 383,

Born on 14-10-1934

Calving number	Date of service	Description of Sire	Number of services required for conception	Date of calving	Gestation period in days	Sex of calf
First	13-4-37	Scindhi Bull 73	(1)	20-1-38	292	Female
Second	8-4-38	73	(1)	2-1-39	269	Male
Third	20-4-39	73	(1)	2-2-40	288	Female
Fourth	12-5-40	160	(1)	13-3-41	305	Male
Fifth	15-5-41	160	(1)	20-2-42	281	Female
Sixth	26-4-42	160	(1)	6-2-43	282	Female
Seventh	19-4-43	61	(1)	25-1-44	281	Male
Eighth	8-4-44	102	(2)	16-2-45	322 (?)	Female
	3-5-44	102			289	
Ninth	5-5-45	238	(2)	3-5-46	362	Male (Monstrosity)
	23-1-46	238				

ACKNOWLEDGEMENT

The writers are indebted to Sri. R. N. K. Sundaram C.D.A., N. D. D., Senior Lecturer in Agriculture and Superintendent, Central Farm, Coimbatore, for making the College Dairy Records available to draw up the above table, without which the summary of observations made earlier would not have been possible.

CASTRATION OF A TIGER.

BY

CAPT. M.R. LAXMAN RAO, G.B.V.C., P.G., A.I.D.R.I.,
Veterinary Officer, i/c Palace Stables & Dairy, Gwalior, C.I.

A tiger belonging to the Animal Department, Gwalior State, was reported to be getting very ferocious and also going down in general condition. With a view to rendering it more docile, it was decided to castrate it.

On the 14th of May 1947, the animal was secured with strong ropes, the front and hind limbs tied separately and the head held slightly high (Fig. 1). The scrotum was cleaned thoroughly, the testicles were exposed one by one by scrotal incisions and removed by ligaturing the cords. The scrotal incisions were not sutured.



The subsequent treatment consisted in keeping the part clean and painting the area with Tr. Iodine. Healing was uneventful and was complete in about three weeks.

After the operation, there has been a definite change in the temperament of the animal. There was also improvement in its general condition.

Acknowledgement:—I am very much indebted to Lt.Col.H.K.Mehra, M.R.C.V.S., A.I.D.I., Director, Veterinary Department, and to Major Vasant Rao Ingle, Officer, Animal Department, for their help and keen interest rendered during this operation.

HAEMORRHAGIC SEPTICAEMIA.*

BY

D. F. G. SMITH, MAJOR, R.A.V.C.

The following clinical note on haemorrhagic septicaemia is recorded in view of what is believed to be a rare syndrome of this disease amongst buffaloes.

An outbreak occurred at the Military Farm, Nowshera (N.W.F.P.), in December 1940, on which at the time there were 200 buffaloes and 200 cross-bred and Friesian cattle.

The disease commenced amongst adult buffaloes housed in two adjoining sheds and later spread to the cows which were accommodated nearby. In all nine cases in buffaloes and three in cows occurred, all of which were fatal.

A particular point of interest was the curious predilection site of the swellings (usually located in this disease in the lymphatic glands of the throat). With the exception of two buffalo calves which died of acute septicaemia within twelve hours, the remaining seven adult buffalo cows all developed enormous swellings in the genitalia. Of the three buffalo cows, however, two developed the typical parotid submaxillary swellings with ensuing apoplexy and the other developed a hyperacute mastitis which was fatal in four days.

These notes are chiefly concerned with describing the peculiar effect upon the buffaloes affected with this disease. A few hours after the initial rise in temperature, a small swelling commenced at the lower fornix of the vulva (Fig. 1). It spread rapidly to the upper fornix and in as little as four hours assumed enormous dimensions (see Fig. 2). Death occurred (in all but one case) at periods varying between eight and seventy two hours after onset of the disease.

The genital swellings, with the exception of one case (Fig. 3) were tense and acutely painful. Erosion of the vaginal mucous membrane occurred and considerable quantities of a yellow serous exudate, containing numerous *Pasteurella* organisms, oozed from these swellings.

Towards the end of the outbreak which lasted nearly three months, the disease appeared to lose some of its initial virulence. Haemorrhagic septicaemia serum was administered to all animals on the farm within a week of the occurrence of the first case. The last case (Fig. 3) occurred in an adult buffalo which, incidentally, had received 25 c.c. of haemorrhagic

* Veterinary Record, No. 29, Vol. 59, August 2nd, 1947.



Fig. 1.



Fig. 2.



Fig. 3.

septicaemia serum 28 days previously. Death occurred six days later. The swellings in this case were pendulous and not very painful.

The outbreak was confirmed as haemorrhagic septicaemia by the Indian Military Veterinary Laboratory, Lahore, consequent upon examination made of various specimens including internal organs.

Records show that the incidence of this disease was above average on military farms in India during 1940-41. The syndrome of the disease described in this note, however occurred only at Nowshera.

TRYPANOSOMIASIS IN CIRCUS TIGERS.

BY

M. LAKSHMANA RAJU, G.M.V.C., P.G. (EDIN.),
District Veterinary Officer, Ellore.

AND

P. S. SWAMINATHAN, G.M.V.C.,
Veterinary Assistant Surgeon, Ellore.

It is well known that Trypanosomiasis is very common among equines and bovines in this Province. Its occurrence in two circus tigers is recorded in this report.

History.—The manager of a circus troupe which was camping at Ellore from 13-2-47 to 24-2-47 sought veterinary aid on the 13th February 1947 for the treatment of two sick tigers. The junior author (P.S.S.) paid a visit and found one Bengal tiger in a collapsing condition. The tiger was quite well on the 11th and was taken to the shows. On the 12th also it was found normal. Only on the 13th morning when the cage was brought to the tent from the railway station it was found sick. Blood smears were taken which on examination showed Trypanosomes resembling *T. evansi*.

Treatment.—The tiger weighed 200 lbs. 1.2 grammes of Antrypol dissolved in 10 c.c. Aqua distillata was given intravenously. But in about half an hour the animal died.

Blood smears of all the rest of animals in the troupe were examined. On the whole 48 samples of blood from 4 tigers, 1 cheetah, 3 lions, 3 bears, 17 horses, 6 goats, 8 dogs and 6 elephants were examined on 14-2-47. All were found negative for Trypanosomes excepting the one from a tigress aged one year and four months. This was confirmed by the Principal, Madras Veterinary College, who stated that organisms resembled *T. evansi*. This tigress had normal appetite, looked apparently normal and did its part in circus well. It weighed only 110 lbs. 0.6 grammes of Antrypol in 10 c.c. of normal saline was injected intravenously on 14-2-47. Once in every two days blood smears were examined and it was found that the Tryps disappeared from the blood from the very next day after injection. A second injection in dose of 0.3 grammes was given on 21-2-47. On 24-2-47 no organism was found in the blood smears but the circus troupe left Ellore on 25-2-47 and therefore further examination of blood could not be made.

Animal Husbandry and Veterinary College, Hyderabad-Dn. 135

Technique of injection.—The tigress was cornered to one side of its own cage with the aid of two wooden planks put cross-wise inside the cage leaving little space for the animal to move about. A rope was put round its shoulders and held tight by two men outside the cage to restrict its movement further. One of the legs was drawn out through the iron bars and held tight by the trainer. The internal saphena vein was selected and injection was given with a 10 c.c. all glass syringe with an eccentric nozzle.

College News

BIHAR VETERINARY COLLEGE, PATNA

The following students are declared to have passed the Diploma Examination (Supplementary) held in the month of July, 1947:—

(In order of merit)

- | | |
|-------------------------------|-------|
| 1. Dharendra Narayan Jayeswal | Bihar |
| 2. Misbahun Nabi Zoberi | U. P. |
| 3. Tirbeni Singh Sharma | Bihar |
| 4. Satya Prasad Nautiyal | U. P. |
| 5. Ram Narain Chowdhary | Bihar |

S. K. SEN,

18th July, 1947.

Secretary, Board of Examiners,
Bihar Veterinary College, Patna.

ANIMAL HUSBANDRY AND VETERINARY COLLEGE, OSMANIA UNIVERSITY.

The following students have passed the first professional B. V. Sc.

Examination:—

- | | |
|----------------------------|--------------------------------|
| 1. Srinivas Rao Ade, | 9. Syed Kalimulla Kadri, |
| 2. D. S. Parmanand Rao. | 10. Seshachandra Deshmukh, |
| 3. M. Kishen Rao, | 11. Baburao Karalghikar, |
| 4. M. A. Razzack, | 12. Munawar Hussain Khan Kamal |
| 5. B. M. Deshmukh, | 13. Syed Abdul Sayeed |
| 6. Mohd. Jaffer Ali | 14. Kesheo Rao Deshpande |
| 7. D. Murli Manohar Swamy, | 15. Prabhakar Devalankar |
| 8. Mohd. Fariduddin, | 16. Syed Nusarat Ali, |

M. HABIB KHAN, M.R.C.V.S.,
F.Z.S. (Lond.),

Hyderabad-Dn }
7th July, 1947 }

Principal.

Correspondence

[The views expressed in letters addressed to the Editor represent the personal views of the writer and must not be taken as expressing the opinion or having received the approval of the A.I.V.A.]

Rinderpest and its Control in the Province of Bombay

The following Copies of Correspondence between Mr. Trisal and myself may be found interesting. R. N. Naik.

"Some time back, I read with interest, your article "Rinderpest and its Control in the Province of Bombay" in *Indian Veterinary Journal* Vol. XXIII pp. 203 to 216 (November 1946.) I would be grateful if you could very kindly let me have information on the following points:—

1. The keeping qualities of Goat blood virus, compared with those of Goat tissue virus,
 2. The quantity of blood that could be drawn from a goat—say one year old—without any risk of killing the goat thereby.
 3. The comparative severity of reaction in vaccinated cattle by Goat blood virus and Goat tissue virus
- Thanking for the trouble."

Reply 13th February 1947 from Mr. R. N. Naik Bacteriologist, Bombay Veterinary College to Mr. K. N. Trisal, Laboratory Officer, Veterinary Department, Kashmir State.

"I have received your kind letter dated the 19th instant with great pleasure. Replies to your questions are given here below:—

1. There is no difference in the keeping qualities of Goat virus contained either in blood or in Goat spleen tissue. For, blood is a tissue. Goat-adapted Rinderpest virus behaves alike both in blood and in spleen in respect of its viability when exposed to different degrees of temperature and light. But, in the aqueous suspension, the spleen tissue virus remains viable for about 12 hours at the room temperature and then loses its viability rapidly due to the destructive action of temperature, light and contamination.
2. Theoretically blood amounting to a maximum of 2 per cent of the body weight can be removed from a perfectly healthy goat

not subjected to long travels and malnutrition during the previous month.

3. The reaction produced by Goat blood virus and by Goat tissue virus is similar. For, the virus contained both in the blood and in the spleen tissue is the same and any dose which is equal to or more than the minimum infective dose behaves alike in the production of reaction when injected into animals susceptible to Rinderpest."

R. N. NAIK,

Bacteriologist, Bombay Veterinary College.

Cattle Shows.

We have received reports of the following Cattle Shows which we regret we are not able to publish *in extenso* owing to extreme scarcity of paper. These Cattle Shows as could be seen from the reports are getting extremely popular and we are sure they materially contribute to focus the attention of the public on the importance of the livestock in the rehabilitation of the country. We are very glad that the Veterinarians as the custodians of the livestock of the land, are taking a prominent part in the organisation and running of these Shows.

1. The 4th Chanda District Cattle Show held at Ahiri on the 15th and 16th February 1947.
2. The Chindwara District Cattle Show (Aboriginal) held at Delakhari on the 21st and 24th March 1947.
3. The Katol Tahsil Cattle Show held at Katol from 31st January to 2nd February 1947.
4. The Ongole and Regional Cattle Shows and Exhibition, Ongole, May 1947.
5. The Second Annual Toda Buffalo Show held in Wenlock Downs on the Nilgris on 7th December 1946.
6. The Fourth Buldana District Livestock Agricultural and Industrial Exhibition held at Khamgaon from the 21st to 23rd January 1947.
7. The Fifth Yeotmal District Livestock, Agricultural and Industrial Exhibition held at Yeotmal from 14th to 16th February 1947.

8. The Sixth Amraoti District Livestock, Agricultural and Industrial Exhibition held at Daryapur from 25th to 27th February 1947.
9. The First Livestock and agricultural Exhibition held at the aboriginal tract, Dharni, on the 22nd and 23rd March 1947.
10. The Fourth Akola District Cattle Show held at Mangrulpir on the 28th and 29th March 1947.
11. The Fifth Morsi Taluq Livestock Agricultural Show held at Salbardi on 19th and 20th February 1947.
12. West Godavary District Cattle Show held at Ellore on the 16th February 1947.

Abstracts

A Comparative Study of Rinderpest Bull-Goat Viruses, with a brief survey of the work done with Rinderpest Goat Virus in Madras.—By R. Krishnamurti, G.M.V.C.

A brief survey of the work done on the goat virus alone method of inoculation in the Madras Province is given.

Two strains of goat virus, the Mukteswar strain and the Madras strain, are maintained at the Serum Institute, Madras, and there is not much difference in the nature and percentage of reactions set up by them in the control calves.

It was found both from experiments conducted in the laboratory and in the field that the method of protecting cattle against rinderpest by the goat virus alone was not quite a safe one. The reactions set up by this method in the control calves were severe resulting in a mortality of 21.5 per cent amongst them. In the field, though the percentage of mortality was negligible, the severity of reactions set up by this method, especially in buffaloes, was such that it became unpopular amongst the ryots who could ill-afford to have some of their animals incapacitated for work and their milk yield reduced even for a short period.

The spleen tissue emulsion in normal saline solution also behaved in the same manner as the blood virus; hence it could not also be advocated for use without anti-serum.

From experience gained in this province it may be said that the ideal attenuation of the virus for use as such without anti-serum, in bovines, cannot be said to have been obtained by successive passages through goats.

The percentage of mortality amongst goat virus control calves was observed to be much less, less than even half of that which occurred amongst the calves used for the production of bull virus, though appreciable difference was not noticed in the degree and nature of other reactions.

Indian J. Vet. Sci. 15, 4.

Investigations on Famine Rations. Mango-seed kernel.—By N. D. Kehar and R. Chanda.

Investigations have been made to find if mango seed kernel, hitherto rejected as waste, could be utilised as a feed for livestock.

Mango-seed kernel has been fed to bullocks with advantage to the extent of 50 per cent of the total digestible protein. The animals developed a liking for the kernels after a couple of weeks' feeding. During about 12 weeks' feeding adult animals gained, on an average, 33 lb in body weight and developed a fine condition.

Mango-seed kernel is a rich source of protein and carbohydrate. According to available figures, it is estimated that 70 million lb. of digestible protein and 760 million lb. of starch equivalent will be available per annum from this hitherto unrecognised source. The digestible protein obtained from 80 lb. of oats is equal to that obtained from 100 lb. and starch equivalent from 86 lb. of mango-seed kernel.

The high digestibility coefficient of the protein and nitrogen-free extract and the biological value of the protein give the seed a place in the list of important foodstuffs.

Work on the feeding of mango-seed kernel to rats is in progress.

Indian J. Vet. Sci. 15, 4.

Demodectic Mange of Goats in India.—By M. K. Sreenivasan, G.M.V.C., and S. W. H. Rizvi, G.B.V.C.

Demodectic mange of goats is recorded for the first time in India.

The mode of spread of the infection appears to be through long cohabitation.

Suckling kids in contact with diseased mothers have not been affected.

The infection has shown no special affinity for pregnant and long-haired goats as reported in foreign countries.

Experimental transmission was shown to be possible, infection occurring after an incubation period of 4-8 months.

Indian J. Vet. Sci. 15, 4.

Blood changes in cattle fed on a protein deficient diet—By Narain Das Kehar and V. V. S. Murty.

Observations on the morphological and chemical constituents of the blood of normal cattle and of those fed on a protein-deficient diet are presented. It has been found that the red cells, white cells, cell volume, sugar, haemoglobin, iron, total cholesterol, calcium, inorganic phosphorus, magnesium, non-protein nitrogen and the protein fractions are decreased in protein-deficient animals. As the globulins are especially associated with the integrity of the body cells, it may be that the decreased amounts of these immunologically active fractions in protein-deficient animals render them more susceptible to infection.

Indian J. Vet. Sci. 15, 3.

Preliminary studies on Calcium and Phosphorus in milk and feeds of Sahiwal cows.—By S. V. Desai and M. L. Mathur.

The percentage of calcium and phosphorus in the different milkings of a particular day in a cow showed no variation.

There was practically no variation in the percentages of calcium and phosphorus in the course of four weeks except in the premilkers or those cows which reached or passed the peak period.

When the cow was in the peak period the percentage of calcium and phosphorus in the milk decreased and when that period passed, the percentages of these elements in the milk increased.

When the yield was below 10 pounds, in the last days of lactation the percentage of Ca^{10} and $\text{P}^{2.5}$ increased.

In the premilk the percentage of phosphorus was very high and that of calcium very low, so much so that the ratio of $\text{Ca}^{10} : \text{P}^{2.5}$ attained a value as high as 1 : 3.64 in the beginning.

The percentage of calcium in the premilk gradually increased and continued to do so till a week or two after calving when the tendency towards stabilization appeared. On the other hand, the percentage of phosphorus increased for some time, reached the maximum before calving and then decreased. It continued to do so for a week or so after calving and then the tendency towards stabilization appeared.

The ratio of calcium to phosphorus was different in individual cows.

Indian J. Vet. Sci. 15, 3.

Association News

BOMBAY VETERINARY MEDICAL ASSOCIATION

The following three communications addressed by the President, Bombay Veterinary Medical Association, Bombay, one to the Secretary to the Government of Bombay, Agriculture and Rural Development Department, Secretariat, Bombay and the other two to The Hon'ble Minister for Agriculture, Veterinary and Forest, Secretariat, Bombay, are published for the information of the members.

From

D. S. LAUD, G.B.V.C., F.I.Z.S.,
President, Bombay Veterinary Medical Association,
Parel, Bombay.

To

The Secretary to the Government of Bombay,
Agriculture and Rural Development Department,
Secretariat, Bombay.

(1)

Subject:—Reorganization of the Veterinary Dept.

Sir,

With reference to Government Resolution, Reconstruction Department, 1038/III dated 2nd May 1947, I have the honour to state that my Committee learns with regret that the Veterinary Department is to be amalgamated with the Livestock Department and the separate Veterinary Department will cease to function. In this connection I beg to request you to kindly clear the following points:—The Resolution reads "the Agricultural Commissioner should be requested to submit proposals for the abolition of the Veterinary Department".

1. Whether the Veterinary Department is really to be abolished, if so, what will be its position in the new reconstruction plan.

2. Whether the Livestock is to be amalgamated to the Veterinary Department or whether Veterinary Department to the Livestock Department.
3. The present designation of the head of the Veterinary Department is changed to "Director of Animal Husbandry and Veterinary Science, Bombay Province". Does this mean that he is the Head of both the Departments or only of one and if not of both and if the Veterinary Department is to be abolished why the designation is changed.

In this connection I wish to bring to your notice that in other Provinces like the Punjab, U. P., and Madras Livestock Department is amalgamated with the Veterinary Department and the working has been quite satisfactory. In fact the Veterinary Department is the parent department, the members of which are the custodians of the health or otherwise of the cattle of any Province. If the Veterinary Department is expanded and maintained in perfect order and the livestock attached to it, the nation's wealth will be enhanced. It will be seen that Animal Husbandry, Dairy Development and such other sciences are entirely dependant on the sound health of the cattle. As such there will be no justification to either abolish the Veterinary Department or amalgamate it with the Livestock Department.

My Committee views with great awe and foresees danger in the proposed policy of either amalgamation or abolition of the Veterinary Department since it is not based on sound and scientific principles. From the Government Resolution it is seen that the Government desires not only to abolish the Veterinary Department or amalgamate it with the Livestock Department but to bring the proposed new Department and the new Head of the Department under the Agricultural Department (Reorganised) and the reasons given in the Government Resolution are self-condemning when the activities of the Agricultural Department are so unmanageable, there is no justification to make the Agricultural Department much more complicated by adding one more section and depriving the independent existence of the Veterinary Department. It will be very advantageous if the Livestock Department is amalgamated to the Veterinary Department and the New Department allowed to function quite independently without forming a part of the Agricultural Department, which is so much expanded that there is no justification for including the Veterinary Department under it, thereby unnecessarily depriving the Veterinary Department of an independent and proved efficient existence and complicating the working of the Agricultural Department and thus deriving ultimately no benefit for the Nation by such an arrangement.

In determining the policy regarding the Veterinary Department, has the Government consulted the Head of the Department and the Members of the Department at least some seniors who are well wishers of the Veterinary Profession in the Province, if this is not done may I request you to do the same before it is too late.

Your most obedient servant,

22nd July 1947.

D. S. LAUD,
President,

(2)

From

D. S. LAUD, G.B.V.C., F.I.Z.S.,
President, Bombay Veterinary Medical Association,
C/O Bombay Veterinary College, Parel, Bombay

To

The Hon'ble Minister for Agriculture,
Veterinary and Forest, Bombay Government,
Secretariat, Fort, Bombay

Subject :—Shifting of the Bombay Veterinary College to Poona.

Sir,

I have the honour to inform you that there is a strong persistent rumour that the Bombay Veterinary College will be shifted to Poona next year. If this be so, I beg to invite your urgent attention to the fact when a deputation of the Bombay Veterinary Medical Association waited upon you on the 15th November 1946, you were kind enough to give them an assurance that before taking a final decision in the matter you will visit the College and ask the Members of the deputation to be present at the time to discuss the matter on the spot. I understand that you visited the College lately but did not see your way to invite the Members of the deputation. So I respectfully remind you to fulfill your assurance before taking any final decision in the matter.

I have the honour to be

Sir,

Your most obedient Servant,

1st August 1947.

D. S. LAUD.

(3)

To

The Hon'ble Minister for Agriculture,
Veterinary and Forest, Secretariat, Bombay

Subject:—Preferential treatment to war returned personnel
in the Veterinary Department.

Sir,

I have the honour to invite reference to my letter Nos. 168 dated 24-12-1946 and 177 dated 8-3-47 and the two memorials submitted by the Veterinary Assistant Surgeons of the Civil Veterinary Department and state that the Government have not cared to respect the grievances of such an overwhelming majority and has been upholding the war-retained personnel of the department for appointments to higher posts without any justification. If this policy is continued any longer the already deteriorated morale of the department will take a grave turn. I would, therefore, request the Government to take up the matter immediately as it is already too late and remedy this grievance before it becomes irreparable.

Your most obedient servant,

D. S. LAUD,

President.

Bombay,

22nd July 1947.

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Extract.

IMPROVEMENT OF LIVESTOCK

Madras Government Scheme

Madras, Aug. 20.

The Government have under consideration a scheme for the improvement of livestock in the villages, submitted by the Director of Veterinary Services. The scheme, which is expected to cost the Government an additional expenditure of about seven lakhs of rupees, aims at concentrating breeding bulls in suitable limited areas.

Under the scheme, a compact area consisting of a village or villages will be selected containing about 300 cows of breeding age. Four breeding bulls obtained from the Government Farm or an approved breeder will be stationed in the area and maintained by the Government. The breeding bulls and the breeding operations will be under the control of a stockman compounder who will be assisted by two attendants to look after the bulls. All the other male stock in the area will be castrated and only the services of these bulls will be made available to the cows. No fee will be charged for covering operations. The animals in the area will be protected against rinderpest and other cattle diseases. The cows and the progeny will be tattooed and the necessary records with regard to the breeding, pedigree etc., will be maintained by the stockman-compounder. Such of those male calves, which are considered suitable for stud purposes, will be purchased by the Government and issued to new centres. As the male stock are of primary importance the scheme proposes to give to the ryots, who own male calves, at the rate of Rs. 5 per calf per month, commencing from their seventh month, for a period of two years.

In the non-breeding tract areas, heifer calves are more important and it should be given greater attention. Therefore, it is suggested that owners of heifer calves be given Rs. 5 per mensem per calf for a period of two years commencing from the seventh month. This subsidy will be continued in the area until about the fourth or fifth generation when the subsidy to the female calves will be stopped and the male calves subsidised as in the breeding tract area.

The Veterinary Department have requested the Livestock Development Officer to suggest the breed of bull to be used in each district and the District Veterinary Officers have been asked to suggest the centre where the scheme should be introduced in their respective districts.

The scheme, it may be recalled, was discussed at a meeting of the Provincial Livestock Improvement Board, recently, when the general principles of the scheme were accepted.

Hindu
21-8-47.

Review.

Diagnostic Methods in Veterinary Medicine.—By Geo. F. BODDIE, B.Sc., (Edin.), M.R.C.V.S., F.R.S.E. Second Edition, 1947, Published by Messrs. Oliver and Boyd, Ltd., Edinburgh. 15s. net.

This book which was first published in 1944 has been revised and brought out as a second edition in 1946 and this in itself is a testimony to its merit.

The revised edition contains as many as twenty chapters with 3 appendices, an index and over 50 illustrations. The diagnostic methods have been considered under the various systems of the body like the Respiratory, Digestive, Nervous, etc while special chapters are found on clinical bacteriology, clinical helminthology, clinical haematology, allergic reactions and urine analysis. The chapter on Diagnosis of Poultry diseases, which is an addition in this edition is to be welcomed. A specially interesting feature of the book is that the consideration of the diagnostic methods is taken up after a short, preliminary survey of the Regional Anatomy—a feature which will commend itself to the student and practitioner alike.

We would like to offer our one or two suggestions for the next edition which we are sure will not be long in coming. The chapter on Genitalia and Mammariae is a very important one and it would be better if "the clinical and laboratory methods employed in the diagnosis of pregnancy in the larger domestic animals" are dealt with in greater detail and not left for "reference to standard works on the subject" Secondly, the radiographs in their original have got a value of their own and should be reproduced as they are. The drawings from them, however ably done in the book, cannot give us an accurate and correct picture of the lesions,

A prominent omission under the diseases of the nostrils is the Nasal Granuloma caused by *S. nasalis*—a very common disease of bovines in India.

On the whole, the book is ably and very well written and it should be in the hands of every student, teacher and practitioner.

The publishers have done their part well, considering that we have not yet got over the war time difficulties on newsprint and printing.

Obituary.

M. LAKSHMANA RAJU, G.M.V.C., P.G. (Edin.)

We regret to record the untimely demise of Mr. M. Lakshmana Raju, G.M.V.C., P.G. (Edin.), District Veterinary Officer, West Godavary, Ellore, on 27th July '47 at Ellore, leaving behind him his widow, two young children and a host of friends to bemoan his loss.

We offer our condolences to the members of the bereaved family.

B. B. JOSHI, G.B.V.C.

We deeply regret to announce the sad demise of Mr. B. B. Joshi, G.B.V.C. on 18th May 1947. The late Mr. Joshi was born at Birwadi (Kolaba District, Bombay Province), on the 3rd May 1886; passed his Matriculation examination in 1904, joined the Bombay Veterinary College as a Government scholar and graduated in the year 1907. He joined the Civil Veterinary Department soon after and was posted in charge of important dispensaries in the Province. In the year 1916 he was appointed as a Lecturer in Veterinary Science at the Agricultural College, Poona, where he served till his retirement in 1939. He was very popular among the students of the College and members of the teaching staff.

After retirement he was selected for the post of Director of Animal Husbandry by the Jodhpur State, where he served for about 3½ years. Due to ill health he retired and returned to Poona where he finally settled. He contributed many valuable clinical articles and compiled a manual on Animal Husbandry with special references to cattle breeding in 'Marwar' and the same is awaiting publication by the Durbar of Jodhpur State.

In him the Veterinarians have lost an able and everwilling guide. He leaves behind a widow, two sons, two daughters, many relatives and host of professional brothers to mourn his loss.

We offer our condolences to the members of the bereaved family.

(Ed. I.V.J.)

A. J. MacDONALD,

A Great Loss To The Poultry World.

A tragic event took place on the 23rd August 1947, in Cumberland (England) where Mr. A. J. MacDonald Poultry expert Izatnagar, was on a Holiday. Whilst bathing he accidentally got drowned. He was in perfect state of health and it is surmised that he should have got a cramp while in water. Mr. Mac Donald was specially recruited by the Government of India on a contract basis for five years in 1938 for the development of Poultry Industry in India. On expiry of the contract it was further renewed, but in 1946 he preferred to resign and take up a better job in United Kingdom. Mr. Mac Donald was a practical man and believed in practical work only. It was due to his untiring zeal and extremely capable direction that the laying, hatchability and mortality records of the Poultry Farm at Izatnagar compared so very favourably with those of some of the best Poultry institutions in the world. He achieved this within a short period of five years. As a field worker he was devoid of all show and false prestige. He was responsible for organising Military Poultry Schemes to which he supplied day old chicks in thousands for about two years by working day and night. The development of Poultry Industry in recent years in our country is not a little due to his remarkable powers of organisation. He organised Poultry Clubs, Poultry Shows, revived Poultry Gazette, supplied breeding stock, hatchable eggs, day old chicks far and near besides touring throughout the country for giving free advice to Poultry institutions and private concerns. As a student and subordinate of his for over five years, I pay this homage to him and convey my condolences to Mrs. Mac Donald and her small children. Surely the Poultry World has lost a giant in the field. May his soul rest in peace!

K. N. JOSHI,
*Experimental Cattle Breeding Farm,
107, Victoria Road, Jubbulpore, C. P.*

Our heartfelt condolences to the members of the bereaved family.
(Ed. I.V.J.)

We deeply regret to have to record the death of the following Veterinary Officers in F. M. S., and we give our heartfelt condolences to the members of the bereaved family.

Mr. A. R. KUPPUSWAMY, G.B.V.C., P.G. (Mad.)
Assistant Veterinary Officer, Penang, during the second half of 1944 after a short illness.

Mr. K. SITARAMAN, G.M.V.C., Senior V. I. Raub, F.M.S., in December 1944, leaving behind his brother Mr. K. Vaidyanathan, G.M.V.C. V.I., of Alor Gajah, F.M.S.

Lt. Col. W. ORR, the first Director of Veterinary Services, British Military Administration, Malaya, following a motor accident at Johore during the early part of December 1945.

M. N. K. KURUP, G.B.V.C. Malacca Veterinary Department.

DEVASAN, G.B.V.C. of Johore Veterinary Services, under tragic circumstances a staunch member of the I. N. A.

ERRATA.

Vol. XXIII, No. 5, (March 1947).

Page 384. Please read the heading of the article "Bact. Alkali-
genes" instead of "Bact. Algali-*genes*." Page 384, para 2, line 2.—Please
read "Gram negative" instead of "Gram positive."

Vol. XXIII, No. 6. pp. 466, paragraphs 1 and 2.

We regret that in the article entitled "Tape Worms in Canines—Therapeutic value of remedies used" by Mr. S. Ramanarayanan, G.M.V.C., the word 'Tabloid' was used in connection with the products of two manufacturers when the word "tablet" was intended. The word 'Tabloid' being the registered trade mark of Messrs. Burroughs Wellcome & Co., (The Wellcome Foundation, Ltd.), the use of this mark in connection with the products of two other firms was an unintentional inaccuracy.

Ed. I. V. J.



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