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Journal

1937 - July

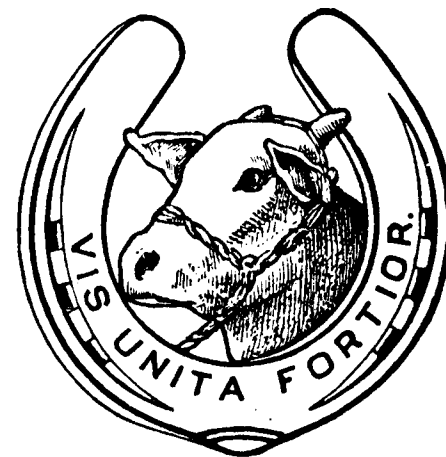
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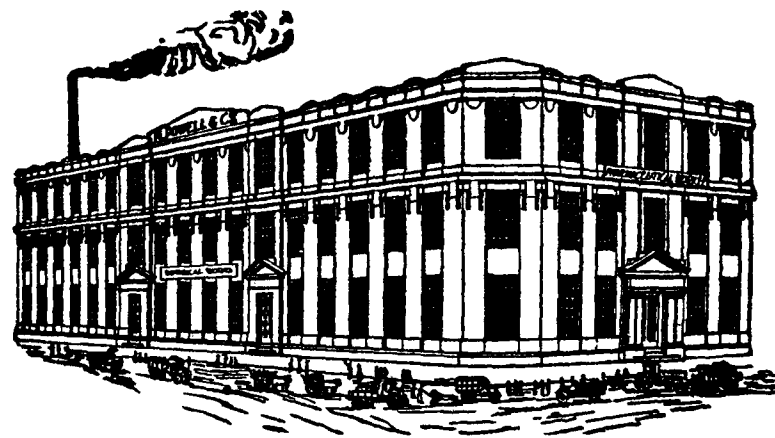
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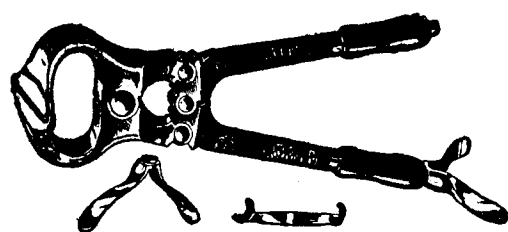
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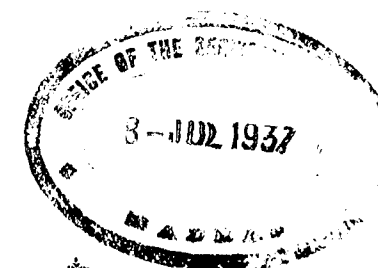
July 1937

Vol. XIV.

No. 1.

The Indian Veterinary Journal.

(The Journal of The All-India Veterinary Association.)



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NOTICE

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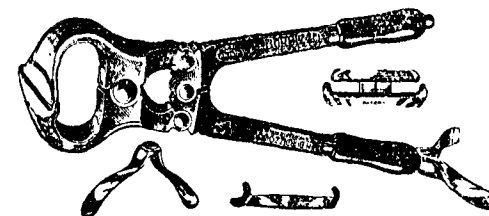
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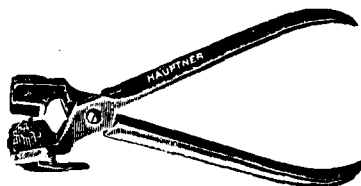
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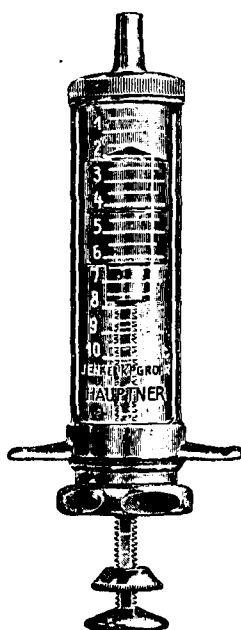
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JULY, 1937

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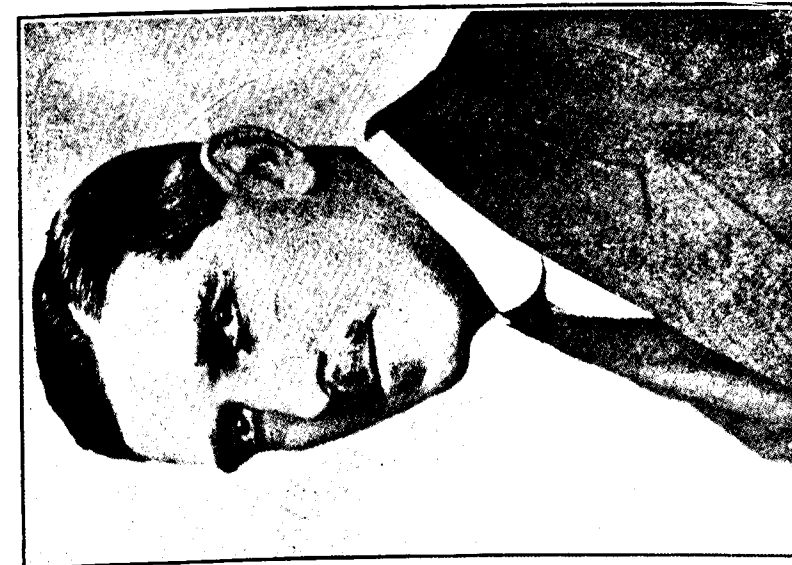
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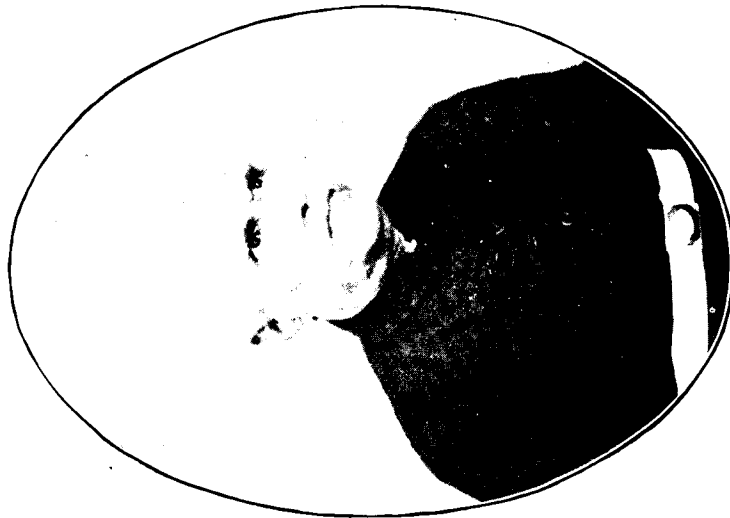
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THE INDIAN VETERINARY JOURNAL.

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JULY 1937.

[No. 1.

General Articles.

A CHECK-LIST OF THE TREMATODE AND CESTODE PARASITES OF THE DOMESTICATED ANIMALS IN BURMA.

BY

J. BHATTACHARJEE, B.SC., M.R.C.V.S., F.C.S.,
Offg. Veterinary Research Officer, Insein, Burma.

I. Introduction.

This article gives a list of the trematode and cestode parasites of the domesticated animals, hitherto recorded from Burma, together with five trematode and three cestode parasites not recorded previously.

With the exception of those parasites, indicated by asterisks against their names, all were identified by me from the collections of the Veterinary Research Laboratory, Insein, Burma. The most animals dealt with in this article include elephant (*Elephas indicus*), cattle (*Bos indicus*), buffalo (*Bos bubalus*), sheep (*Ovis aries*), goat (*Capra hircus*), horse (*Equus caballus*), dog (*Canis familiaris*), cat (*Felis catus* var. *domesticus*), and pig (*Sus cristatus*).

II. **Class TREMATODA** Rudolphi, 1808.Order **DIGenea** V. Beneden, 1858.Sub-order **Prosostomata** Odhner, 1905.Family **Dicrocoeliidae** Odhner, 1910.Sub-family **Dicrocoeliinae** Looss, 1899.Genus *Eurytrema* Looss, 1907.**Eurytrema dajii* Bhalerao, 1924.

Host. Cattle.

Situation. Bile-ducts.

Recorded by Bhalerao (1924, 1926, 1935). Baylis (1929).

Eurytrema pancreaticum (Janson, 1889).Syn., *Dicrocoelium coelomaticum* Giard and Billet, 1892.

Host. Cattle.

Situation. Pancreas.

Recorded by Evans and Rennie (1908). Bhalerao (1935).

Family **Echinostomidae** Dietz, 1909.Sub-family **Himasthinae** (Odhner, 1911) Bhalerao, 1931.Genus *Paryphostomum* (Dietz, 1909) Bhalerao, 1931.**Paryphostomum sufrartifex* Lane, 1915.Syn., *Echinostomum sufrartifex* Lane, 1915.

Host. Pig.

Situation. Intestine.

Recorded by Bhalerao (1935).

Family **Fasciolidae** Railliet, 1895.Sub-family **Fasciolinae** Odhner, 1910.Genus *Fasciola* Linnæus, 1758.*Fasciola gigantica* Cobbold, 1855.Syn., *Distomum giganteum* Diesing, 1858.

Host. Cattle, buffalo, sheep, goat.

Situation. Bile-ducts.

Recorded by Evans and Rennie (1908). Jackson (1921).
Bhalerao (1924, 1935). Railliet (1924).

A Check-List of the T. and C. Parasites of D. Animals in Burma 3

Fasciola hepatica Linnæus, 1758.Syn., *Distomum hepaticum* Linnæus, 1758.

Host. Sheep, goat, cattle.

Situation. Bile-ducts.

Recorded by Neumann (1905). Evans and Rennie (1908).
Bhalerao (1924, 1935).*Fasciola jacksoni* (Cobbold, 1869).Syn., *Distomum elephantis* Diesing, 1858.

Host. Elephant.

Situation. Bile-ducts, duodenum.

Recorded by Neumann (1905). Evans and Rennie (1909).
Evans (1910). Gaiger (1910). Railliet (1924). Bhalerao
(1926, 1935).Sub-family **Fasciolopsinae** Odhner, 1910Genus *Fasciolopsis* Looss, 1899.**Fasciolopsis buski* Lankester, 1857.Syn., *Distomum buski* Lankester, 1857.

Host. Pig.

Situation. Intestine.

Recorded by Bhalerao (1924, 1926, 1935).

Family **Paramphistomidae** Fischœder, 1901.Sub-family **Paramphistominae** Fischœder, 1901.Genus *Cotylophoron* Stiles and Goldberger, 1910*Cotylophoron cotylophorum* (Fischœder, 1901).Syn., *Paramphistomum cotylophorum* Fischœder, 1901.*Cotylophoron indicum* Stiles and Goldberger, 1910,

Host. Cattle, goat.

Situation. Rumen.

First record of this parasite from Burma.

Genus *Fischœderius* Stiles and Goldberger, 1910.

Fischæderius elongatus (Poirier, 1883).

Syn., *Gastrothylax elongatus* Poirier, 1883.

Fischæderius ceylonensis Stiles and Goldberger, 1910.

Host. Cattle.

Situation. Rumen.

First record of this parasite from Burma.

Genus *Gastrothylax* Poirier, 1883.

Gastrothylax crumenifer (Creplin, 1847).

Syn., *Gastrothylax* sp. Evans and Rennie, 1908.

Gastrothylax sp. Gaiger, 1910.

Host. Cattle, buffalo.

Situation. Rumen.

Recorded by Bhalerao (1926, 1935).

Genus *Paramphistomum* Fischœder, 1901.

**Paramphistomum birmiense* Railliet, 1924.

Syn., *Amphistome* No. 3. Evans and Rennie, 1908.

Host. Cattle.

Situation. Bile-ducts.

Recorded by Evans and Rennie (1908). Railliet (1924).
Bhalerao (1935).

Paramphistomum cervi (Schrunk, 1790).

Syn., *Amphistome* Nos. 4 and 5. Evans and Rennie, 1908.

Paramphistomum pisum Leiper, 1910.

Host. Cattle, sheep, goat.

Situation. Rumen, bile-ducts.

Recorded by Bhalerao (1924, 1935). Bhattacharjee, 1930.
(Mitchell, 1931).

**Paramphistomum microon* Railliet, 1924.

Syn., *Amphistome* No. 2. Evans and Rennie, 1908.

Host. Cattle.

Situation. Cæcum.

Recorded by Evans and Rennie (1908). Railliet (1924).
Bhalerao (1935).

**Paramphistomum orthocœlium* Fischœder, 1901.

Syn., *Paramphistomum parvipapillatum* Stiles and Goldberger,
1910.

Host. Cattle.

Situation. Rumen, cæcum.

Recorded by Gaiger (1910). Bhalerao (1935).

Genus *Pseudodiscus* Sonsino, 1895.

Pseudodiscus hawkesi (Cobbold, 1875).

Syn., *Amphistoma hawkesii* Cobbold, 1875.

Host. Elephant.

Situation. Colon.

Recorded by Evans and Rennie (1909). Gaiger (1910).
Railliet (1924). Bhalerao (1926, 1935). Smith (1933).

Pseudodiscus collinsi (Cobbold, 1875).

Syn., *Amphistoma collinsii* Cobbold, 1875.

Host. Elephant.

Situation. Large intestine.

Recorded by Bhalerao (1935).

Sub-family **Gastrodiscinae** Monticelli, 1892.

Genus *Gastrodiscus* Leuckart, 1877.

Gastrodiscus aegyptiacus (Cobbold, 1876).

Syn., *Gastrodiscus minor* Leiper, 1913.

Host. Horse.

Situation. Large intestine.

First record of this parasite from Burma.

Gastrodiscus secundus Looss, 1907.

Host. Horse, elephant.

Situation. Large intestine.

Recorded by Evans and Rennie (1908). Gaiger (1910).
Bhalerao (1926, 1935).

* *Gastrodiscus* sp. Evans and Rennie, 1908.

Host. Cattle.

Situation. Bile-ducts.

Recorded by Evans and Rennie (1908). Bhalerao (1935).

Genus *Homalogaster* Poirier, 1883.

Homalogaster sp.

Host. Buffalo.

Situation. Cæcum.

First record of this parasite from Burma.

Sub-family **Pfenderinae** Fukui, 1929.

Genus *Pfenderius* Stiles and Goldberger, 1910.

Pfenderius papillatus (Cobbold, 1882).

Syn., *Amphistoma papillatum* Cobbold, 1882.

Host. Elephant.

Situation. Colon.

Recorded by Bhalerao (1926, 1935).

Family **Psilostomidae** Looss, 1900.

Genus *Testifrondosa* Bhalerao, 1924.

* *Testifrondosa cristata* Bhalerao, 1924.

Host. Pig.

Situation. Intestine.

Recorded by Bhalerao (1924, 1935). Baylis (1929).

Family **Schistosomidae** Looss, 1899.

Genus *Schistosoma* Weinland, 1858.

Schistosma bovis (Sonsino, 1876).

Syn., *Bilharzia bovis* Sonsino, 1876.

Host. Cattle.

Situation. Portal veins.

First record of this parasite from Burma.

III. **Class CESTODA** Rudolphi, 1808.

Order **CYCLOPHYLLIDEA**, Braun, 1900

Family **Anoplocephalidae** Cholodkovsky, 1902.

Sub-family **Anoplocephalinae** Fuhrmann, 1907.

Genus *Anoplocephala* Blanchard, 1848.

A Check-List of the T. and C. Parasites of D. Animals in Burma 7

* *Anoplocephala manubriata* Railliet, Henry and Bauche, 1914.

Host. Elephant.

Situation. Intestine.

Recorded by Meggitt (1926, 1927). Bhalerao (1935).

Anoplocephala perfoliata (Goeze, 1782).

Syn., *Tænia perfoliata* Pallas, 1782.

Host. Horse.

Situation. Intestine.

First record of this parasite from Burma.

Genus *Moniezia* Blanchard, 1891.

Moniezia benedeni (Moniez, 1879).

Syn., *Moniezia planissima* Stiles and Hassall 1893.

Moniezia parva Sauter, 1917.

Host. Cattle.

Situation. Intestine.

First record of this parasite from Burma.

Moniezia expansa (Rudolphi, 1810).

Syn., *Moniezia oblongiceps* Stiles and Hassall, 1893.

Host. Cattle, sheep, goat.

Situation. Intestine.

Recorded by Meggitt (1926, 1927). Bhattacharjee, 1930 (Mitchell, 1931). Bhalerao (1935).

Sub-family **Thysanosominae** Fuhrmann, 1907.

Genus *Avitellina* Gough, 1911.

* *Avitellina centripunctata* (Rivolta, 1874).

Syn., *Tænia centripunctata* Rivolta, 1874.

Stilesia centripunctata Rivolta, 1874.

Host. Goat.

Situation. Intestine.

Recorded by Meggitt (1926). Bhalerao (1935).

**Avitellina goughi* Woodland, 1927.

Syn., *Avitellina centripunctata* (Rivolta, 1874).

Host. Goat.

Situation. Intestine.

Recorded by Meggitt (1927). Bhalerao (1935).

Family **Dilepididae** Railliet and Henry, 1909.

Sub-family **Dipylidiinae** Stiles, 1896.

Genus *Dipylidium* Leuckart, 1863.

Dipylidium caninum (Linnæus, 1758).

Syn., *Taenia Cucumarina* Bloch, 1782.

Host. Dog.

Situation. Intestine.

Recorded by Meggitt (1927). Bhattacharjee, 1930, (Mitchell, 1931). Bhalerao (1935).

Family **Mesocetoididae** Fuhrmann, 1907.

Genus *Mesocetoides* Vaillant, 1863.

**Mesocetoides tenuis* Meggitt, 1931.

Host. Dog.

Situation. Intestine.

Recorded by Meggitt, (1931) Bhalerao (1935).

Family **Tæniidae** Ludwig, 1886.

Genus *Tænia* Linnæus, 1758.

Tænia tazniformis Batsch, 1786.

Syn., *Tænia crassicolis* Rudolphi, 1810.

Host. Cat.

Situation. Intestine.

Recorded by Meggitt (1926). Bhalerao (1935).

Cysticercus of *Tænia hydatigena* Pallas, 1776. (*C. tenuicollis*).

Host. Cattle, sheep, goat.

Situation. Liver, abdominal cavity.

Recorded by Meggitt (1927). Bhattacharjee, 1930 (Mitchell, 1931) Bhalerao (1935).

Cœnurus of *Multiceps multiceps* Leske, 1780.

Host. Goat.

Situation. Central nervous system.

Recorded by Meggitt (1926, 1927). Bhalerao (1935).

Order **PSEUDOPHYLLIDEA** Carus, 1863.

Family **Diphyllobothridæ** Luhe, 1910.

Sub-family **Diphyllobothriin** Luhe, 1910.

Genus *Diphyllobothrium* Cobbold, 1858.

Diphyllobothrium latum (L., 1758).

Syn., *Dibothriocephalus latus* L., 1758.

Host. Dog.

Situation. Intestine.

First record of this parasite from Burma.

Diphyllobothrium ranarum (Gastaldi, 1854).

Host. Dog.

Situation. Intestine.

Recorded by Meggitt (1927). Baylis (1929). Bhalerao (1935)

**Diphyllobothrium reptans* (Diesing, 1850).

Host. Dog.

Situation. Intestine.

Recorded by Meggitt (1924). Baylis (1929). Southwell (1930) (Bhalerao (1935).

IV. Acknowledgments.

I wish to record here my thanks to the Director of Veterinary Services, Burma, the Veterinary Research Officer, Insein, Burma, and officers of the Department for providing the facilities to carry out this work and for their encouragement. Also to Mr. J. Smith, B.Sc., M.R.C.V.S., late Field Veterinary Research Officer, Insein, Burma, for his collection of elephant parasites during his stay in Burma.

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AN OUTBREAK OF EQUINE ENCEPHALO MYELITIS*

BY

PREM NATH KAK, L.V.P. (Hons.),

Veterinary Officer, Kashmir Body Guard Cavalry, Jammu Cantt.

The first outbreak of this nervous disease, when it occurred among the horses of Loralia Cavalry Regiment in November 1934, stirred up the veterinarians in India. The total number of cases infected then were 71 with 21 deaths (mortality 20.58%). The first case occurred on 3rd November 1934, and the last one after an interval of 53 days. Investigation of the malady showed that it simulated the one prevalent in Europe and America known as Equine Encephalo-Myelitis.

The outbreak with which I had to contend with was the second of its type that had occurred in that cavalry regiment in India. Before dealing with the actual outbreak, a few passing remarks about the Cavalry Regiment in which it occurred may be of interest. The Equine strength of that unit is about 650. Nearly 500 horses move from Jammu to Srinagar in summer and return by the first or second week of November. Srinagar is at a distance of 200 miles from Jammu. This outbreak started a couple of weeks after the return of the regiment from Srinagar in November 1936.

Subjects.

The subjects were Australian horses of all ages mostly geldings and also some Indian horses. The majority of these horses were tethered in the open but some were housed in stables.

Symptoms.

The symptoms varied in different cases. The first case occurred on November 20th 1936, when an Australian mare aged 7 years was found with a temperature of 102°F and was disinclined to move. The next night she fell down paralysed and lay on one side with stretched hind limbs evincing no

*This paper was read by the author at the Ninth All-India Veterinary Conference, Bombay, December 1936.

sensation on pin pricking. All efforts at raising her were ineffective.

On 22nd morning another gelding was reported to have fallen down suddenly. It was found to be lying almost paralysed on one side and it was discharging small quantities of sticky urine. At the same time another gelding was found showing incoordination of movement when walked and ready to fall down. By the same evening its penis was hanging down and urine was dribbling in drops.

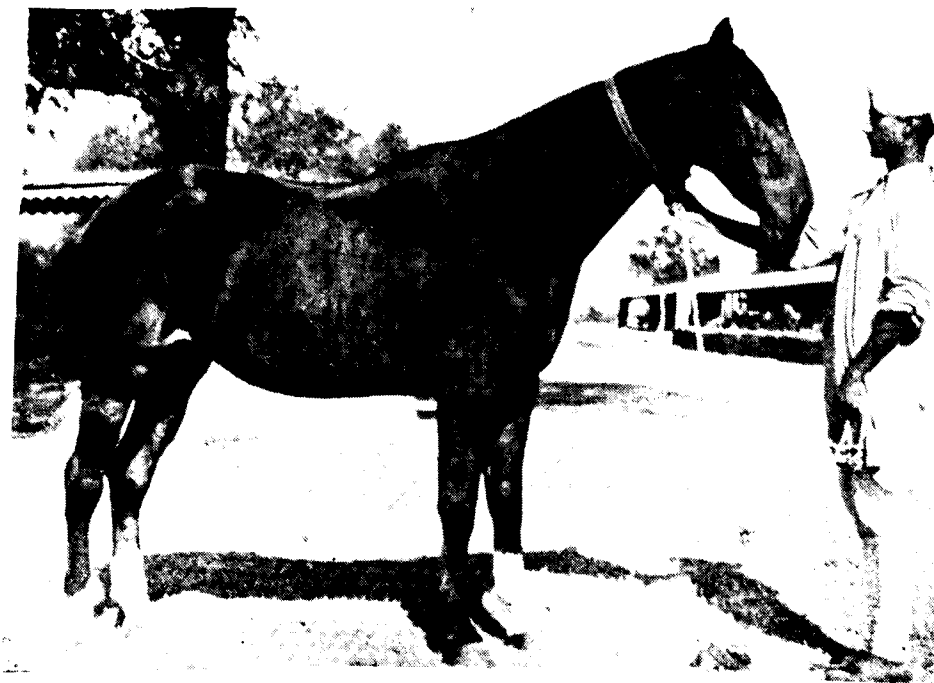
On November 23, another horse was found knuckling at the hind fetlocks which were swollen, dragging its hind toes, plating its hind feet, lifting its fore limbs very high and finally showing twitching of the facial muscles and dribbling slimy urine.

The same day the temperature of all the cavalry horses was recorded and four more horses were found to have fever ranging from 102° to 104°F. All these developed varying symptoms of the disease later.

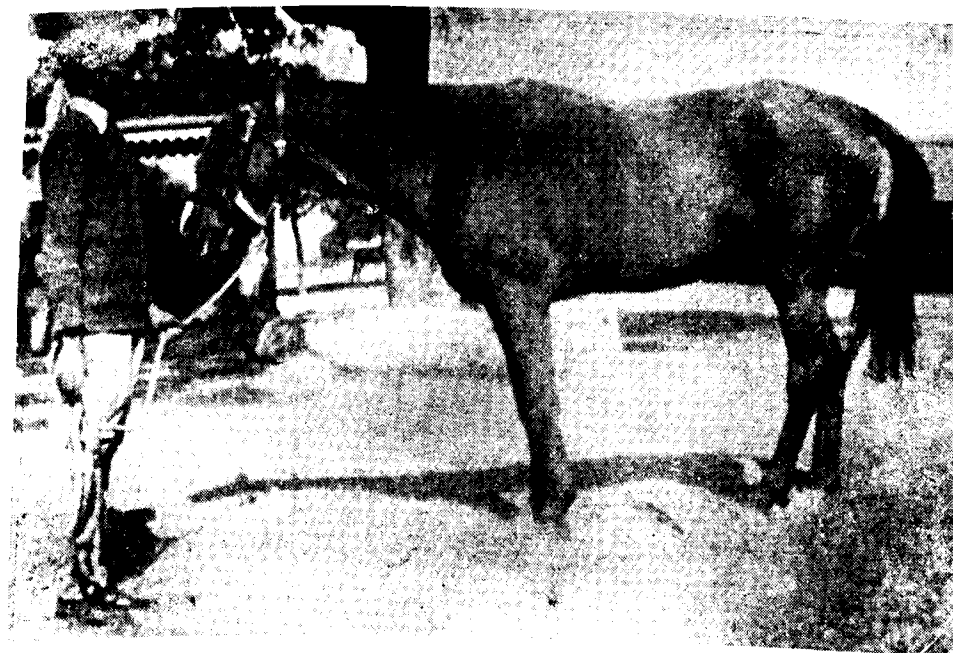
Twenty Polo ponies of this regiment had left Srinagar two weeks before the regiment marched down and had proceeded to Sialkot 24 miles from Jammu. The first case occurred there on 30th November, 1936. A valuable Polo pony "Gallantry" showed colic and slight pyrexia. She was admitted there in the Military Veterinary Hospital, Sialkot. The next day she fell down paralysed and broke the sling in which she had been slung. She had retention of urine, twitching of facial muscles and was stretching and bending her neck often. She died the third day after the onset of the disease.

Another horse among those at Sialkot was detected by me to have a stiff gait. It was taken to Jammu forthwith in an ambulance. The third case at Sialkot occurred two days later. It was worse than the first two cases. The animal was carried to Jammu in the ambulance, in which she fell down.

Cases continued to occur in the regiment until the 30th December, when I had as many as 31 with only two deaths (mortality 6.45%).



Case in the pyrexial stage before developing paralytic symptoms.



Case showing swollen fetlocks and plating of hind feet.



* 'Royal Lancer' being exercised with the help of bamboo posts held under the body. The pony shows extreme emaciation and was removed eight days after it was put in the slings.

Plate No. 8.



* 'Royal Lancer' after three months.

An Outbreak of Equine Encephalo Myelitis 13

The chief symptoms noticed were fever, ranging from 102° to 104° F two to four days before the onset of paralytic symptoms, stiff gait, incoordination and disinclination to move, dragging and plating hind feet, knuckling at the hind fetlocks, paralysis of the bladder, lifting fore feet high, amaurosis, hanging and swollen penis in geldings and corresponding inflammation and erection of clitoris in mares and finally dribbling of slimy urine in both the sexes. In two cases marked hemiplegia was noted. During the course of illness the appetite of the animals was not impaired.

Only one case of Piropasmosis occurred (in an Australian Remount) during the incidence of the disease in question. The mode of transmission could not be traced since cases occurred sporadically in different squadrons of the regiment.

Diagnosis.

On the occurrence of the second case, the disease was diagnosed by me as Equine Encephalo Myelitis and immediate steps were taken to combat it. Mr. Taylor, Principal of the Punjab Veterinary College, Lahore, very kindly came to my aid on November 24th, and confirmed my diagnosis.

Prognosis.

This varied with the different cases. The cases which were taken on hand early fared very well. The first four cases were severely affected. The first died after five days illness with a fever reaching 109° F. The one that died at Sialkot was a very bad case. The rest have recovered. One among those that recovered, a Polo pony "Royal Lancer" was so bad that it was not expected to survive, and its photographs, one taken ten days after it had fallen ill and the other three months later, show how the animal has recovered.

Treatment.

Immediate slinging combined with intravenous injections of divided doses of six drams of hexamine for the first four days, thereafter one dram doses were administered in drinking water whenever necessary. A physic ball was given immediately and also, in some cases, Arecoline Hydrobromide subcutaneously. Four

hourly catheterization of urine was resorted to with benefit. Warm soap water enema and fomentation to the penis proved very useful. Strychnine sulph gr. 1 had to be given subcutaneously in some cases. Daily forced exercise, with support when necessary, was found to be extremely useful. One horse could not be taken out of the slings for eight days since it was almost hanging on them. Had it been unslung the chances of its recovery would have been very remote.

Post-mortem.

REPORT 1. The first case that died showed gastro-intestinal hæmorrhages. Spleen was enlarged and soft. Kidneys congested and hæmorrhagic. The bladder contained thick blood tinged urine and its wall was oedematous.

REPORT 2. This was very kindly forwarded to me by Major Berry from Sialkot. Lungs were congested and the abdominal cavity contained a quantity of blood stained fluid. There was a partial twist of the large bowels. The intestines were congested.

Specimen of the brain of case number one that died has been forwarded to the Director, Imperial Veterinary Research Institute, Muktesar, and his report is awaited.

Specimens of Sera, Urine and Fodder were forwarded to the Serologist, Muktesar and his report is appended.

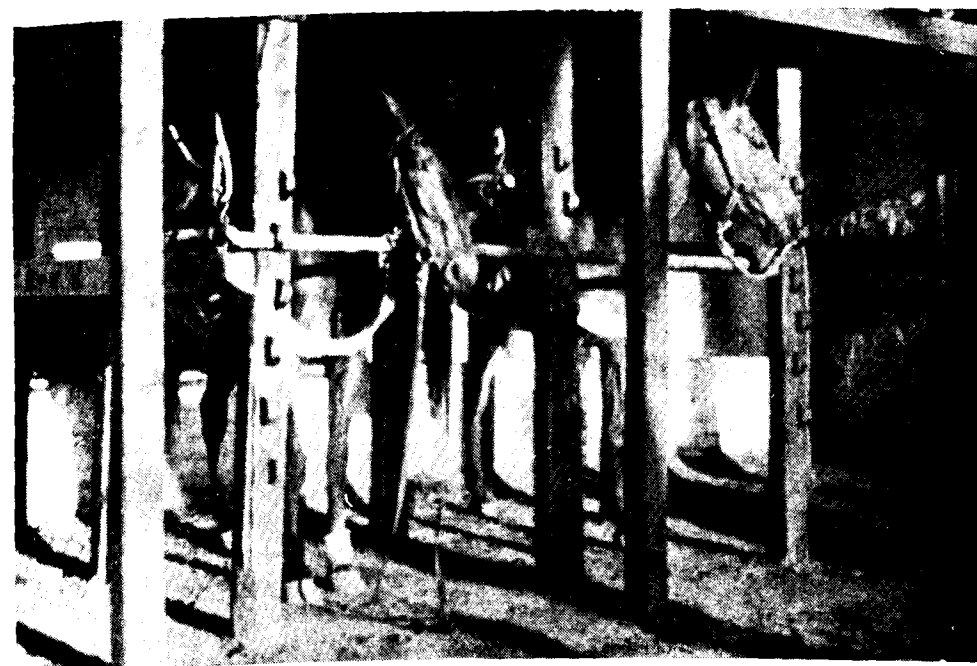
Remarks.

The percentage of mortality in this outbreak, was only 6.45 per cent, which is interesting. The probable reasons for the low mortality is early diagnosis and prompt action in treating the cases. Mr. Taylor, remarked in his letter: "It is very interesting and you did very well to lose only two. Taking the temperatures was very instrumental in preventing a number of bad cases".

In the end, I have to express my indebtedness to my colleague Dr. J. N. Mirakhur who spared no pains in helping me in controlling this outbreak.



First case in slings.



Cases in improvised slings.

My grateful thanks are due to Brigadier H.L. Scott, C.B., D.S.O., M.C., for very kindly going through my paper.

IMPERIAL VETERINARY RESEARCH INSTITUTE,

Muktesar,

Muktesar-Kumaun. U.P. 27TH JANUARY 1937.

To

The Veterinary Surgeon,
Kashmir Body Guard Cavalry,
Jammu Cantonment.

Sir,

Subject:—Equine Encephalo Myelitis.

Ref:—Your letter No. E., dated the 4th December 1936.

The material received with the above quoted letter has been examined with the following results:—

1. *Serum.* The calcium and phosphorus contents of the sample from horse No. 123 are normal, but in the case of the other sample received unlabelled the phosphorus content is very high and the calcium content is normal.
2. *Urine.* The sample from horse No. 123 is negative for sugar, albumin and phosphates, but the sample from No. 55 though negative for sugar, contains albumin and phosphates in fairly large quantities.
3. *Fodders and Grains:* The phosphorus content of the sample of barley is slightly below normal while the calcium and phosphorus contents of the rest are normal.

(Sd.) J. F. SHIRLAW, M. R. C. V. S.,

Offg. Veterinary Research Officer,

Incharge Serology.

SCABIES AND ITS TREATMENT*

BY

K. R. S. IYER, G. B. V. C.,

Lecturer, Bombay Veterinary College.

Scabies is the name given to the result of infection of the body with the Sarcoptic mange mites. Its meaning in common parlance is Itch or to scratch. Sarcoptes are members of a class of parasitic acari and they live in the skin of the mammals.

Horses are liable to be affected with Sarcoptes, Psoroptes and Chorioptes, though only Psoroptic mites have been obtained from the scrapings sent from this hospital.

Cattle are liable to be affected with Sarcoptic, Psoroptic and Chorioptic mange though only sarcoptic mites have been seen in the scrapings sent from this hospital.

In sheep Sarcoptic and Psoroptic mites are seen though Chorioptic are also said to affect them.

Besides Demodex, dogs and cats are also affected with Sarcoptic mange. The scaly legs in fowls are due to Cnemidocoptes, a variety of Sarcoptes.

Demodex has been said to affect other animals besides dogs and cats.

I am sure you will agree with me that not much work on a large scale has been done by the Civil Veterinary Department on this disease in comparison with the Army Department.

The publication of H. M. Stationery Office titled 'Official History of the War and Veterinary Services' 1925, has devoted many pages for this disease dealing in all its aspects and I shall just quote to you only such relevant portions demonstrating the effect of the disease in animals and the unsatisfactory Therapeutical measures still in vogue. "In the South African War although Mange had to be dealt with on a large scale, no system of treatment was discovered that did not possess many serious

* Read at the 9th All-India Veterinary Conference, Bombay, 1936.

drawbacks. The method largely adopted in that war was that of dressing continuously with a mixture of paraffin or sulphur and a fixed oil, and this system was practised at first in the early stages of the Great War. The results as a rule were more or less blistering of the skin and grave loss of condition. Much inefficiency resulted from the indiscriminate use of oily dressings in dealing with the wide-spread outbreaks of Mange among the animals of the new armies being trained in the Northern and Eastern Commands during 1915.

It was not until the very end of the War that the ideal method of using oily dressings was discovered. This method was the alternate use at short intervals of horse fat and sulphur dressings and hot water and steam baths whereby the maximum cleansing and stimulation of the skin were effected..... During the first twelve months of the War it was found possible to keep Mange well under control, but as in other matters affecting military efficiency Veterinary Supervision and animal management could not altogether keep pace with the rapid increase in the strength of the Army which took place in the year 1915 and 1916. Consequently Mange spread steadily from the autumn of 1915 until March 1917, when the maximum figures were reached. In that month in France no less than 3.8% of the animal strength were affected no less than 16,624 patients were under treatment in Veterinary Hospitals"

No therapeutical measures alone could give success in the treatment of diseases caused by Ectoparasites unless pari passu general principles in mange treatment are adopted. They are (a) Isolation of the affected; (b) Examination of the "incontacts"; (c) Grouping of the free ones separately; (d) Changing of camps known to have been occupied by the affected ones; (e) Disinfection of kit and harness; (f) Disinfection of quarters; (g) Burning of bedding; (h) Separate personnel with a separate site for dressing affected ones.

The application of dressings over the affected parts must be preceded by clipping, scraping, and brushing.

Mange (Sarcoptic) in camels during the War was treated with the old formula consisting of sulphur, carbonate of soda and whale oil, and was most satisfactory. Amongst the dressings tried were Stockholm tar, Colocynth tar, and paraffin emulsion, and calcium sulphide. Experiments made with Cooper's dip for the treatment of camel mange were unsuccessful.

Mange, Sarcoptic and Psoroptic in mules and horses were treated during the War either with dips or fumigation with sulphur fumes. Dipping baths consisted of lime 12 lbs., sulphur 30 lbs., water 100 gals. Dip the affected animal two or three times weekly during three to seven weeks according to the extent of the disease.

Fumigation was carried with a special plant erected for the purpose. The animal was exposed for one hour to a concentration of sulphur fumes sufficiently high to extinguish a spirit lamp. (Sulphur dioxide S^{O_2}).

Having given you thus an idea of the old methods of treatment adopted during the War, I would like to give you an idea of a method that I have copied in the treatment of sarcoptic mange in dogs at this hospital. I say, deliberately, it is "copied" since the drugs have been used by some firstly on human beings and then by veterinary surgeons on horses very successfully in the continent of Europe.

My attention was drawn to two abstracts that appeared in the Veterinary Bulletin of August and September 1935. It is stated therein that "The value of the treatment was tested on 30 horses in different stages of the disease, the details being as follows. The horse is clipped, washed, and scales removed; it is then rubbed all over with 60% Hyposulphate of soda, when dry, 10% Hydrochloric acid is rubbed in; repeat four times preferably the same day. In severe cases leave the horse to dry after a maximum of two and a half applications, and finish with acid solution the next day. Two carefully applied courses should effect a cure in all cases. Friction lasts 25 to 30 minutes. Drying after the hypo takes 40 to 45 minutes and after the acid 90 minutes. The author looked for

evidence of toxic effects by analysis of the urine and examination of the blood before and after the treatment and no contra-indications to this treatment were found. It is quite harmless to the patient and the applicant. It is simple and available to all, it does not erect or mat up the hairs which are easily washed afterwards and it is cheap and very effective.

Since reading these abstracts, I have used widely in dogs suffering from Sarcoptic mange in various stages and a few even on the verge of being destroyed owing to extensive affection and always they have been cured without even one exception. There is a female Chimpanzee that is attending the out-patient department of this hospital with Psoroptic mange and is receiving the same treatment. She has also marvellously improved. I would recommend to one and all assembled here to copy this treatment in all species of animals affected with this type of mange and publish their results.

In the human beings on whom this method was originally employed, this treatment has undergone a slight change in the percentages of the solutions employed as can be seen from a recent issue of the Archives of Dermatology and Syphilis (August 1936.) The Hypo strength has been brought down to 40%, and the (Hcl.) hydrochloric acid to 4% probably due to the texture of the human skin.

SKIN GRAFTING.

BY

K. S. PRAKASA RAO, G.M.V.C.,

Veterinary Assistant Surgeon, Narsaraopet, Madras.

Many cattle with extensive ulcers are discarded by cattle owners since in many cases their expenditure to obtain a cure will cost them more than the actual cost of the animal. Some times the cost is not considered, but a cure is uncertain. Such animals will be a source of annoyance and expense to the owner.

I pondered over to find out a cure for burns and ulcers and it struck me that grafting of skin, which is so extensively practised in the Human Surgery, might be the most appropriate remedy.

I practised the method on some animals and it was a success. The technique was very simple and the subject was published by me in this *Journal* some years ago. The method which had been adopted, though easy in itself, presented certain difficulties when it was done on place where bandaging was not possible. Recently I had opportunities to treat several such cases with success and this time the question of bandaging the part has been completely dispensed with. A brief description of my methods may be of interest to some of us. Cleanliness of the instruments and thorough sterilisation go a long way for the success. One per cent. common salt solution is made, filtered and then boiled well.

The instruments required for the purpose are three sharp scalpels; one pair of fine scissors and about a dozen artery forceps. The dressings required are:—Sterile vaseline placed in a wide-mouthed bottle and sterile cotton wool and tow.

To begin with, the operator should wash his hands with ordinary soap and water and the ulcer and the seat of operation cleaned thoroughly.

Another spot chosen for the removal of the skin for grafting should also be cleaned with soap and water. Antiseptic soaps are not recommended as traces of an antiseptic solution of the soap will destroy the graft.

The second spot from which the graft is to be taken is shaved and covered over with cotton wool soaked in sterile salt solution.

The ulcer or the burn is next prepared for receiving the graft. It is done by removing the fibrous portion of the ulcerated area in layers to make the whole surface raw and fresh. When finished it should appear as a freshly incised wound and the surface must be as smooth as possible. The next step is to arrest the hæmorrhage. It can be done within a few minutes by means of artery forceps

and by pressure with the palm over a pad of cotton wool soaked in saline solution spread over the wound.

In places where bandaging is not possible small pouches are to be made by cutting a fine layer of tissue extending from the central incision. A number of them should be made over the wound and covered with cotton wool soaked in sterile saline solution. When complete the pouches look externally like two brackets joined together.

The grafts are taken out of the healthy skin by playing the scalpels to and fro by parallel movements. They must be as thin as paper and large enough to adjust themselves in the pouches. Each graft should be adjusted into its pouch and covered by sterile cotton wool. After all the pouches are filled, mild pressure with moist cotton wool should be applied to drive out air bubbles from under the grafts. The wound is closed with a layer of cotton wool smeared with sterile vaseline. Next morning if the dressing is displaced it may be carefully removed and the vaseline wiped off. A small quantity of saline solution may be poured over the wound which is cleaned by gently wiping it with sterile tow or cotton. Sterile vaseline is again applied. The process is repeated for six days when all the grafts adhere and grow to cover the area. Mild antiseptic solutions and ointments may now be used if necessary and the grafts spread very rapidly. Some times when the pouches have thick upper walls the grafts do not spread. The tissue between the grafts should be carefully removed by a sharp scalpel and boric ointment or lint applied to the wound. It is very interesting to watch the different grafts uniting to form uniform skin.

TISSUE VACCINE AGAINST RINDERPEST.**(A resume of the Literature)**

BY

G. N. SREEKANTIAH, G.M.V.C.,

Veterinary Inspector, Mysore Serum Institute, Bangalore.

For over a century and a half, in fact ever since Rinderpest became recognised as a dreadful scourge of cattle population, various methods of protecting cattle against the disease are introduced from time to time. During the last decade Serum-Simultaneous' method of inoculation has been in vogue in India to establish an active immunity. Edwards after completing his experiments successfully on Serum-Virus method of inoculation, took up the work of eliminating the piroplasms from the bull-virus. For this purpose, he passed the bull virus through goats and by about 30 passages he found that the virus goat attenuated to an appreciable degree. Taking advantage of this result he recommended the "goat virus" in place of "bull virus" for serum-simultaneous method of inoculation. Major Sterling (1932-33) in Central Provinces and Major Simpson in Mysore tried Goat Virus alone method with success and it is being adopted now in most of the provinces in India.

A step further has been adopted for combating against Rinderpest by using **Tissue Vaccine**. Various workers tried vaccines prepared from blood or organs removed from the animals affected with Rinderpest. They succeeded in getting good results with the vaccine prepared from the Spleen. Large percentage of virus is contained in the cellular elements of spleen, which fact perhaps is also true of other virus diseases. On this basis Vallee and his colleagues (1925) prepared a useful vaccine for foot and mouth disease from the spleen of the affected animal. Lebailly (1927), Dunken and Laidlaw (1926), prepared a vaccine for distemper from the spleen of affected ferrets and dogs.

The earliest attempt to prepare a tissue vaccine against Rinderpest was that of Kakizaki in 1918, who claimed that he had successfully attenuated the virus in Spleen tissue by the

action of glycerine. He believed that he was able to retain the antigenic value in the tissue vaccine for over a year by preserving the same at 0°C, Kakizaki, Nakanishi and Oizumi (1926) recorded a fall in the antigenic value as the temperature was raised.

Boynton, working in Philliphine Islands, in 1918, prepared a vaccine by using glycerine and 0.5% phenol and heating it for three hours at 42°C. From field observations made on the use of this vaccine, he claimed that the product remained potent for nearly three years.

Curasson and Delpy (1926), inspired by the success claimed by Vallee and his collaborators in the preparation of a vaccine against foot and mouth disease, conceived the idea of preparing a spleen vaccine against Rinderpest by attenuating the virus with 0.2% of Formalin. This vaccine was used 48 hours after preparation. The animals that received big doses from 12 to 100 Gms. of vaccine were said to have developed an immunity.

Daubney (1925-27) and (1928) prepared formalised spleen vaccine in different dilutions of formalin and incubating the same at various degrees of temperature. He recorded that greater concentration of formalin (1:250 to 1:1000) destroyed the antigenic properties of vaccine in short periods (48 to 72 hours), whereas weaker concentration (1:2000 to 1:10,000) was found to be invariably associated with heavy bacterial contamination.

Long before the work of Currason and Delpy, Kelser (1927), and later Kelser, Youngberg and Topaci (1928) modified, Boynton's method which required 6 to 7 months preservation in a refrigerator before it could be mature for use, to the extent that the vaccine could be used within 2 to 3 hours after preparation.

In the preparation of all the abovementioned spleen vaccines, the material is exclusively of bovine origin. Encouraged by the results of his experiments on attenuating the virus by passing through goats, Edwards hoped to prepare a tissue vaccine from goats. This work was taken up by Haddow [1932] at Muktesar with success. Kerr and Menon (1934) adopted this method and prepared a vaccine from the spleens removed from

Rinderpest infected goats at the height of reactions. They claim that the vaccine has keeping qualities up to 30 days at 45° F. and 7 days at room temperature. By this vaccine, 10,764 cattle and buffaloes are said to have been inoculated with promising results. The advantages they claim over 'goat virus' are that more quantity of vaccine can be had from a goat and the vaccine can be preserved for 30 days, as against 1/4 that quantity of blood as 'goat virus' from one goat and with keeping qualities in cold storage for only half the number of days.

Achar (1933-34) recording the work of Nayar and Kuppuswamy states that a sample of Vaccine was prepared in the Institute according to the technique of Kerr and Menon and was tested on susceptible cattle. The vaccine was preserved in cold storage for 3, 16, 34, 59 and 90 days and infected to batches of buffalo calves and goats, each batch consisting of three animals. Goats were used for confirmatory tests and the buffalo calves as test animals for vaccine. The first four batches received 1 c. c. of vaccine and the fifth batch received 5 c. c. each. By a careful study of the reactions it was ascertained that the vaccine preserved at 32° F. for 34 days was potent enough to establish 100 per cent immunity, whereas the vaccine preserved for 50 and 90 days gave only 33.3 per cent immunity. The reactions in goats were suggestive of the presence of the virus. 2 out of 14 control animals [died of Rinderpest, reacted typically whereas none of the test animals] (buffalo calves) showed any reaction. In all respects results agreed with those of Kerr and Menon (1934).

Another noteworthy advantage of this vaccine over goat virus appears to be that the former might be used on buffaloes without serum with no untoward results.

Recently the vaccine has been issued to the field worker in the form of tissue itself from Bengal and Muktesar Laboratories. The advantage of this method is that no preservative is necessary. The spleen is cut into small pieces, put in sterile ampoules, sealed and preserved in cold storage. These ampoules are despatched to the field worker who makes an emulsion with saline solution and uses for inoculating the animals.

The technique described by Kerr (1935) is as follows:—The spleens of reacting goats are removed and cut into pieces of one gram each and are placed in glass ampoules, sealed and stored at 45° F. This material keeps satisfactorily for 30 days at 45° F. and for six days after removal from cold storage. Potency gets lowered on the 7th day and is rapidly lost on exposure to sunlight or excessive heat. The spleen material is emulsified in 0.5 per cent physiological saline to make a one per cent solution and is given in doses of 1 c.c. to cattle and 0.5 c.c. to buffaloes.

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The results of the tests are for the convenience, tabulated hereunder.
Details of inoculation and result of Goat Spleen Vaccine against Rinderpest.

"A"

BUFFALO CALVES.						
Serial No. of batches.	Material Inoculated.	Number of days preserved in cold storage.	Animal number.	Dose.	Reaction to vaccine.	Remarks.
Interval between vaccine and immunity test with virus.						
Result of immunity test with Bovine virus.						
1	Goat spleen Vaccine (carbolised).	3	719	1 c.c.	...	...
	"	3	720	"	Mild thermal	Immune
	"	3	721	2 c.c.	Nil	"
2	"	16	738	1 c.c.	Mild	"
	"	16	739	"	"	"
3	"	16	749	"	"	"
	"	34	805	"	Nil	"
	"	34	806	"	"	"
4	"	34	807	"	"	"
	"	59	832	"	"	"
	"	59	833	"	"	"
	"	59	834	"	"	"
5	"	90	923	5 c.c.	"	"
	"	90	924	"	"	"
	"	90	925	"	"	"
6	Goat spleen Vaccine (formalised).	5	871	1 c.c.	No reaction	Reacted
	"	5	872	"	"	"
	"	5	873	"	"	"

Died on the 4th day due to causes other than Rinderpest.
 No symptoms.
 { Mild thermal reaction only between the 4th and 6th day.
 " }
 No symptoms.
 " }
 " }
 { Severe thermal reaction from 4th to 7th day and specific lesions on the 7th day.
 { Thermal reaction from 4th to 9th day specific lesions on the 8th day.
 { Diarrhoea and faint mouth lesions.
 No symptoms.

Lived.
 Died of Rinderpest.
 "

Details of Inoculation and Result of Goat Spleen Vaccine against Rinderpest.

"B"

GOATS (FOR CONFIRMATORY TEST).						
Serial No. of batches.	Material Inoculated.	Number of days preserved in cold storage.	Animal number.	Dose.	Reaction to vaccine.	Remarks.
Interval between vaccine and immunity test with virus.						
Result of immunity test with Bovine virus.						
1	Goat spleen Vaccine (carbolised).	3	254	1 c.c.	Reacted	...
	"	3	255	"	"	Immune
	"	3	256	"	"	"
2	"	16	278	"	"	"
	"	16	279	"	Nil	"
	"	16	280	"	"	"
3	"	34	305	"	Reacted	"
	"	34	306	"	"	"
	"	34	307	"	"	"
4	"	59	347	"	Nil	"
	"	59	348	"	Reacted	"
	"	59	349	"	"	"
5	"	90	398	5 c.c.	Nil	"
	"	90	399	"	"	"
	"	90	400	"	"	"
6	Goat spleen Vaccine (formalised).	5	368	1 c.c.	No reaction	No reaction
	"	5	369	"	"	"
	"	5	370	"	"	"

Died before immunity test due to other causes than Rinderpest.
 No symptoms.
 " }
 Died next day after giving vaccine due to impaction.
 No symptoms.
 " }
 " }
 Died on the 5th day + E.D. Rinderpest
 Died on the 7th day.
 No symptoms.
 Thermal reaction from the 3rd to 5th day after vaccination.
 " }
 No symptoms.
 Thermal reaction.
 Mild thermal reaction.

Lived.

"

"

*E. D. Etiological Diagnosis.

RINDERPEST—METHODS OF IMMUNISATION

BY

RAO SAHIB J. D'COSTA, G.B.V.C.,

*Retired Deputy Director,**Imperial Veterinary Serum Institute, Izatnagar, Loutulin, Gou.*

As Rinderpest is an infectious and fatal disease and no specific has yet been discovered for the treatment of the same, it is natural that the scientists should concentrate their efforts on finding some means to prevent the spread of the disease among the healthy cattle. Apart from the sanitary and police measures, several methods of producing immunity and saving the cattle have been attempted since early times with varying success. It is intended to give herein a fairly detailed description of the different methods of immunisation and expose the advantages and disadvantages of each method in its application to the cattle in India and other countries.

Bile Method—Prof. Koch working in South Africa about 1897, introduced this method of immunisation in combating the cattle-plague there. It consists in injecting subcutaneously fresh bile in doses of 10 c.c. The bile should be fresh and pure and not stained with blood. It should be removed under strict aseptic precautions from an animal that has died of an acute attack of Rinderpest. The period of immunity is about six months and the immunity is established about ten days after the inoculation of the material.

The advantage of the method is the rather prolonged period of immunity, which is about six months. But the disadvantages are many. If the bile is stained with a small quantity of blood, the inoculation of such material is likely to produce the disease and cause a high percentage of mortality. Rogers working in India about 1900, failed to produce immunity in the Himalayan cattle by bile inoculations. He also failed to produce infection in them but was able to produce immunity lasting about four months in the less susceptible cattle of the plains. The immunity is not established immediately after inoculation but only about the tenth day and hence this method is not useful in immunising

cattle during an outbreak. Sufficient quantity of the material cannot be available to immunise a large herd of cattle and in India particularly, the people are likely to object to the opening of the carcasses on religious grounds.

Dr. Edington working in South Africa about 1899, introduced the Glycerinated Bile method. It consists in injecting subcutaneously a mixture of pure bile and glycerine. The proportion of the ingredient is two parts of the former to one part of the latter. The dose is 15 c. c. to 20 c. c. The addition of glycerine, though acting as a slight preservative, tends to attenuate it to a certain extent.

Dr. Roger working in India about 1900, found filtrate bile effective as it produced passive immunity. It conferred immunity without setting up infection; in this method biles, whether foul or sweet smelling could be employed.

Thousands of cattle were inoculated by the bile method in Africa and the mortality varied from 5 to 10 per cent. In India the method was not adopted on account of the several drawbacks.

The period of immunity conferred by bile inoculations is stated by some workers to be from 3 to 6 months and hence to ensure continuous immunity it was suggested by Theiler that animals should be reinoculated every three months. In order to produce immunity of lasting nature bile inoculations were followed two weeks later by injection of virulent blood. However successful the bile alone and the bile with virus method may have proved to be experimentally, they could not be practical for application on a large scale in the field on account of the great difficulty in obtaining a large quantity of bile from the Rinderpest affected animals.

Defibrinated Blood—This method of immunising was first tried in South Africa and consists in injecting subcutaneously defibrinated blood taken from animals that have recovered from an attack of Rinderpest. In his experiments in Africa, Koch had found that 100 c. c. of blood taken from an animal recently recovered from Rinderpest and inoculated into a healthy one would afford it protection but the immunity resulting would

be passive *i.e.*, of short duration. And in order to confer active immunity on the animals, defibrinated blood inoculations were followed immediately by rubbing discharges of infected animals. There was no advantage in adopting this method of immunisation but the disadvantages were many. There is the great danger of transmitting other diseases particularly redwater and surra. The doses of defibrinated blood are greater than those of the serum alone and a larger number of animals, from which the blood would have to be drawn being required, the method would be very costly. Besides the blood will not keep in good condition for a long period. This method would certainly not appeal to the people in India and it is doubtful if this method has been tried even experimentally.

Serum Alone—It was the early observation of Semner that serum obtained from an animal that recovered from Rinderpest afforded protection to a healthy animal against the disease and it was on the strength of this discovery that the scientists carried out several experiments and inoculations with the result that this method of immunisation proved economical and effective and it has been adopted both in Africa and India and even other countries on an extensive scale. Though the serum—simultaneous method and goat virus alone method are adopted in several parts of India, the serum—alone method still seems to be popular and is in use in greater part of India.

Its advantages are that it gives immediate immunity and the method can be employed during an outbreak, before or after. The injection of serum does not prevent an animal from being worked or sent out for grazing. If the animal is not infected naturally or artificially with blood or discharges, it does not go off feed and is not inconvenienced in any way by the serum inoculation. In milch cows neither the quantity nor the quality of the milk is affected. The serumised animals can be sent out for grazing even with the affected animals and in permitting this mixing there is an advantage of the inoculated animal contracting a mild or severe infection according to the dosage, and the animal being actively immunised. The operation is simple, safe and hardly any complication results

from it. The disadvantages are that this method gives only passive immunity *i.e.*, immunity of short duration lasting from 9 to 14 days, and if the epidemic continues in the same locality, the inoculation of serum has to be repeated in the same animals, a procedure, which is not only inconvenient to the operator but is also much resented by the owners particularly at certain seasons of the year.

There is difference of opinion regarding the period of immunity produced by the serum alone method. Holmes who had carried out several experiments in India was of the opinion that the immunity conferred by the serum alone method lasted from ten to fourteen days. If double the normal dose was injected the immunity conferred would last up to 21 days and treble the dose would prolong the period of immunity up to five weeks. Nicolle and Adil Bey in Turkey and Reudiger in the Phillipines considered the duration was from three weeks to three months. Stockman working in South Africa stated that it lasted only for ten days. Pool and Doyle working in India reinvestigated the subject about 1922, and concluded that a single dose of serum confers immunity for nine days and that while increased doses prolong immunity, this is not proportional to the quantities of serum. The difference of opinion among the workers in different countries is natural as the period of immunity depends upon the quality *i.e.*, potency, and the quantity of the serum injected. Inoculation for instance of a potent serum such as 'Class I' which is fairly fresh and has not been subjected to conditions such as heat, etc., is likely to confer immunity for a slightly longer period than that of a less potent serum such as 'Class P' as the duration of immunity depends upon the number of immune bodies introduced into the system and the time taken for the elimination of the same from the system.

The usefulness of this method as a protective measure is solely dependant on the correct dosage of the serum employed and the dosage has to be regulated according to the several conditions such as potency, susceptibility of cattle, virulence of the epidemic, etc. The dose of anti-rinderpest serum as issued by the Muktesar Institute is 90 c. c. per 600 lbs B. W. for the hill cattle and the efficiency of the product as a prophylactic is proved by what is

known as a serum-test on the highly susceptible himalayan cattle. The serum when subjected to test is fresh and preserved under favourable conditions. Now it is believed that the serum is liable to deterioration even when it is preserved under ideal conditions but that the process is very slow and gradual. On the other hand when the conditions of preservation are not favourable, the process of deterioration can be rapid. Serum which is fairly pure and to which the necessary chemical preservatives have been added, will keep well both in potency and purity when it is stored under cold conditions such as in refrigerators, cold rooms, etc., but when it is stored under conditions which are not favourable viz., when it is exposed to extreme heat or temperatures varying from moderate to extreme heat, the serum is likely to deteriorate both in purity and potency. The Anti-Rinderpest Serum is despatched from Muktesar or Izatnagar to all parts of India and at all seasons of the year and it is well-known that the temperatures in India vary in different parts from cold to extreme heat and parcels of serum may take eight to fourteen days and even longer to reach some of the distant parts of India according as they are sent by passenger or goods train. Then there is another point to be considered that on some Railway stations, where there is neither a closed or open godown, the parcels are liable to be left exposed to the sun for several hours in spite of the instructions on the boxes to the contrary. Therefore all these factors viz., exposure to heat and varying temperatures and length of time the serum is stored before it is actually used for inoculations, are contributory to the deterioration of the product and consequently the dosage of the serum has to be regulated accordingly.

Susceptibility of the animals is an important factor and officers incharge of the inoculations should make proper inquiry and obtain information regarding the susceptibility of the cattle to be inoculated as several failures and mortality among the inoculated ones are due to underdosage of the serum. The rates of serum for serum—simultaneous inoculations have been ascertained in the case of some breeds of cattle but there are several breeds in India whose degree of susceptibility has still to be ascertained, and the rates

for serum inoculations have to be decided. It would be advisable—if the same has not already been done—for the Veterinary authorities to ascertain the degree of susceptibility of the different breeds of cattle found in their districts and fix the rates of serum which are likely to protect them against either natural infection or blood inoculation. In cases where the degree of susceptibility of the animals is not known, the officer in charge of serum inoculations would be well-advised to inquire from the village headman or any intelligent old resident what the percentage of mortality is when an outbreak occurs and fix the rate accordingly and slightly higher to err on the safe side. The rate of serum fixed for the hill cattle by the Muktesar Institute is 90 c.c. per 600 lbs. body weight. Therefore the dose has to be regulated according to the approximate weight of each animal. The correct procedure would be to know the exact weight of each animal to be inoculated with serum. This is not possible in the villages where weighing machines are not available and the next best step, that can be taken, is to ascertain the weight by measurement. The formula is $G^2 \times L \div 300 = B. W.$ The measurement is taken in inches and the result is in lbs. G stands for girth and the tape has to be placed round the girth just behind the elbows and L stands for length and the tape has to be placed from the point of the shoulder to the point of the buttock. The animal has to stand level with the head in normal position and the ground should be as far as possible flat. In case the number of animals is too large and weight of each animal cannot be ascertained easily it will be necessary to have recourse to grouping of the animals according to their size and have the weight of the largest animal of the group taken and accept this as the standard for calculation of the dose of serum, for that particular group.

The next point to consider in fixing the rate of serum for inoculation of animals during an outbreak is whether the cattle to be protected are contact or non-contact, as all healthy animals, which may have come in contact with the affected ones during grazing or work or may have picked up infection in areas occupied by the affected animals, should be considered as practically infected even though the temperatures be normal and the animals

feed well. These animals are in most cases incubating the disease and the rate of serum will have to be increased so as to counteract the infection, which has already preceded the serum inoculation. Other animals which are apparently healthy and not likely to have taken infection are to be considered as non-contacts and may receive the usual protective dose according to the weights. The mistake frequently made by those in charge of serum inoculations is to treat all animals to be serumised as non-contacts and the result is that those incubating the disease react severely owing to the insufficient dose and probably die, directly of Rinderpest or indirectly of any complication consequent on the low vitality and debilitated condition.

It will be seen from the above that the rate of serum in immunising animals by the serum alone method has to be regulated with due regard to the factors, viz., the potency, the deterioration due to exposure to heat and length of time the serum is stored before use, the susceptibility of the animals, their body weight and whether the animals are contact or non-contact. Just as a Veterinarian, when treating a sick animal, takes into consideration the stage of the disease, its size, whether young or adult, and its physical condition, before fixing the dose of any drug, the officer in charge of serum inoculations has to consider in the same way all the factors and fix the rate of serum accordingly.

The appliances which the officer in charge of serum inoculations should provide himself are thermometers, 20 c.c. syringes, injection flask of 50 to 100 c.c. capacity, carbolic lotion, clipping scissors, measuring tape, a few spare needles for injection, cotton wool, stationery, glass measures 50 to 100 c.c. capacity, cotton ropes for casting, enamelled basin and bottle opener.

(To be continued)

The Indian Veterinary Journal.

JULY 1937.

Editorials.

THE ALL-INDIA CATTLE CONFERENCE.

The meeting of the All-India Cattle Conference in Simla on the 25th and 26th May this year is an unique and most useful event in the annals of the Government of India in the modern times. Thanks to the circumstances which contributed towards the availability of the valuable services of Lord Linlithgow for the Viceroyalty of India. It is very well-known that this Conference owes its origin to the keen interest and noble efforts of His Excellency in the Live-stock problem of this country ever since he assumed the charge of his high office. The Live-stock industry has received a great impetus, both by the splendid example and precept of the great Viceroy. We only wish it were possible for all the British Indian provinces to depute *pucca* Development Ministers instead of *Interim* Ministers to attend this important conference and to see for themselves that how a noble man, from another far-off country, come here as Viceroy for a term of only five years has acquired a masterly knowledge of the real problem of the Live-stock Industry here and what an amount of genuine efforts he has been making towards its solution. In his opening address, His Excellency said :—"It is not necessary that I should remind an audience such as this that the ox is the foundation of India's agriculture. Indeed, I am aware of no other single contribution which it lies within our power to make towards the enhancement of the agricultural wealth of this country, which in its potential value, is in any degree comparable with general improvement of the Live-stock". As the Chairman of the Royal Commission on Agriculture in India, he availed himself of the many opportunities for studying, first hand, the several aspects of the Live-stock Industry and having mastered the details, he has now given expression to these facts which cannot be gainsaid by

any body. In support of his statement he said "It has been calculated that the total annual cash value of Live-stock in India, if we include the annual value of cattle, labour, produce, manure and other products is of the order of Rs. 1,300 crores. That, no doubt, is an approximate figure, but it serves at least to indicate the immense values at issue and the scope afforded in this direction for the enhancement of the country's wealth". On a former occasion in connection with the veterinary education while dealing with the Report of the Commission, we have pointed out in these columns, the great economic importance of other farm animals such as sheep, goats and other animals and birds and stressed the necessity for paying attention to their problem also. We are now glad to note that these have been referred to by His Excellency in his address when he said, "And here let me say that while Cattle must be the chief concern of this meeting, many of the proposals which may result from your deliberations will be applicable to other branches of the industry, such as sheep and goat breeding, both in my opinion deserving of and certain to repay in full measure the early attention of the departments concerned, while wool production, the hides and skin industry and in some provinces horse breeding may well derive benefit as a consequence of your labours". It has been indeed the proud privilege of His Excellency the Lord Linlithgow, the farseeing modern Viceroy, to remind the people of this ancient land, of the importance of **Godhanam** and of the usefulness of the progeny of **Kamadhenu** of yore, in a modern plain language, assessing proper economic value to each of the products of this animal industry and he has done it in a telling manner in his address:—"It is impossible to overstate the importance to the agriculture of India of an adequate supply of good working bullocks, for the bullock is practically the sole source of power available to the cultivator, whether for cultivation, for transport, or for the lifting of irrigation water. Nor need I emphasise the value of cattle manure or the importance of the place which cattle dung, used as fuel, still holds in the domestic economy of the large proportion of the rural population." He rightly refers to the importance of milk and its products in this country wherein the diet of the human population is largely vegetarian necessitating the inclusion of milk, ghee and curds in such diet.

We hope that the ministers—pucca as well as interim—the heads of the concerned departments, the Secretaries and the non-official invitees to the conference, have all been well infused with the genuine and useful enthusiasm of the Viceroy in his desire to do all that is necessary towards the improvements of the Live-stock Industry and they in their turn will spread it throughout the country. The response to the appeal of the Viceroy in the matter of breeding bulls has not been till now quite encouraging in some provinces especially in Madras as pointed out by its Development Minister. One of the reasons for such a poor response is in our opinion due to the fact that the concerned authorities in the provinces have not yet moved in this matter either in right earnest or manner. When the Viceroy and the Government of India have recognised the importance of providing the breeding bulls and the Viceroy himself has given a splendid lead by his noble example, if the provincial and district heads should throw themselves heart and soul into the movement, establish personal contact with the public and spread this gospel in the country during their ordinary tours, we are sure the response will be more striking. The message contained in the several speeches of the Viceroy on the subject should be broadcast in the villages in their vernacular by the various high officers concerned. This important work should not be left entirely to the subordinates of the departments. Indeed with a few notable exceptions, very few of the high and influential officers seem to have shown real enthusiasm and zeal in the matter. The Agricultural Departments which are now in charge of the Live-stock Industry in provinces have been quite busy with many and varied problems of soils, seeds, plants, crops and pests whereas the Veterinary Departments whose members are rightly sought for advice by the public on all matters concerning animal life and are also otherwise the right persons to attend to this problem, have been undermanned and further they have not been enthusiastic in the matter because the Live-stock Industry has not been officially placed in their hands. We reiterate that this deplorable state of affairs should soon be remedied if real advance is to be made. Even if a separate Live-stock Department should come into existence as has been proposed at the Conference,

still the public will always look up to the members of the Veterinary Department for help and advice where animal life is concerned as we have already said. We, therefore, strongly suggest that instead of creating another department with a new name, the existing Veterinary Departments should be adequately staffed and the Live-stock Industry handed over to them.

We have been told in the address that proposals for a central institution for higher veterinary education are now assuming definite shape. We have already, in these columns, pointed out how unwise it is to start a central Veterinary Institution for higher Veterinary education at Izatnagar at a great cost—recurring and non-recurring—to produce after all, nine or ten graduates per annum from that institution. We have also shown how wise and necessary it is to develop the existing provincial Veterinary Colleges into the higher grade to produce maximum benefits with the minimum expenditure, to suit the needs of the various provinces of this sub-continent. The Indian Veterinary Profession which has got a right to be heard in the matter, has shown its disapproval of Izatnagar scheme in unmistakable terms at the last All-India Veterinary Conference at Bombay under the presidency of Mr. F. Ware, the acting Expert Adviser in Animal Husbandry to the Imperial Council of Agricultural Research in India. The organised Indian Veterinary Profession has said several times that in the interests of the Indian Live-stock Industry that the existing Veterinary Colleges should be converted without much delay into first grade Veterinary Institutions to give the highest Veterinary education instead of giving effect to a costly and less useful scheme at Izatnagar. We strongly urge the Government to pay attention to this considered opinion of the profession in this country.

We feel constrained to mention, in this connection that the organisers of the Conference should not have failed to invite the All-India Veterinary Association to depute its representative to attend the Conference at Simla. The President of the Association with his ripe experience of Live-stock and Veterinary matters would have given many valuable and practical suggestions towards the solution of the many subjects which came off at the

Conference. We hope this omission will not be repeated next time.

We feel glad to note that the Conference has considered carefully the different aspects of improvement of cattle in India. We had discussed in detail, in the past, in the columns of this *Journal* the problems connected with the subject and it is interesting to note that the views that we held *then* agree with the resolutions passed *now* by that august Body. We hope the Provincial Governments will now at least take up the suggestions and act on them. The resolutions passed at the Conference are all really very important and they touch various necessary subjects such as establishing Live-stock Improvement Fund and Boards, grazing facilities and the necessary staff for the various departments of this large industry. We welcome the idea of holding the *Cattle Day* annually all over the country to collect contributions to the Cattle Improvement Fund and to concentrate public attention on this problem. The country has already been observing from time immemorial during the Pongal Week—Makarāsankranti—a day for the cattle festival. The Cattle Improvement Fund can appropriately be called **Gosamrakshana Nidhi** and the public may be called upon to contribute their mite in cash or kind towards this fund. Besides this annual festival, there are numerous other occasions in the Hindu household when some contribution or other is made towards Gogras, Gopuja and dedication of bulls, etc. All these ancient useful institutions should be harnessed for collecting funds and for explaining the significance of turning these charities into modern and most useful channels. The services of the orthodox priests, heads of mutts, temple trustees and others should be enlisted for this purpose as much good work can be done through them in the Hindu society in these directions. This class of people has been practically and severely left alone till now without being approached for such help. The modern English educated man from the city or town, cannot influence the people in all such religious and social matters. On the other hand, it is an orthodox priest, Matadhipathi and temple-trustee who can give a new orientation to these old charities, both by personal example and precept and

turn them into useful channels. We therefore strongly suggest this step for adoption by the committees which may soon come into existence.

We intend to discuss, later on, the various other subjects dealt with at the Conference. In the meanwhile, we heartily echo what has been very well said by His Excellency in the concluding portion of his address:—"Let me end as I began, by affirming my profound conviction that we can make no greater contribution towards the welfare of the cultivator than by promoting the improvement of cattle throughout India. Let me also assure you that success in this endeavour is within our reach and competence technically, administratively and financially. If we can but come to a right policy and if we persist in our endeavours, public opinion and the enthusiasm of the agriculturists are with us in no uncertain measure. Let us devote ourselves to this great purpose with high courage and unswerving devotion. I am confident that you by your labours in this Conference, will make a most material contribution towards the advancement of animal husbandry in India." We hope the efforts of the Viceroy will produce everlasting benefit to the "Live-stock Industry" of the country.

CORONATION HONOURS.

We note with very great pleasure the **Knighthood** conferred upon **Col. Arthur Olver, C.B., C.M.G., F.R.C.V.S., F.N.I.**, Royal Army Veterinary Corps (retired), Expert Adviser in Animal Husbandry to the Imperial Council of Agricultural Research, and the **Companionship of the Most Eminent Order of the Indian Empire** to **Mr. F. Ware, F.R.C.V.S., I.V.S.**, Director, The Imperial Veterinary Research Institute, Muktesar. They are well-known to our readers and we feel that we are voicing their feelings in heartily congratulating them both on the well-deserved honour done to them.

Y. N. MARATHE, G. B. V. C.

Mr. Y. N. Marathe comes from a respectable middle-class Chitpawan family of Poona and was born at Belgaum on 19th April 1882. He completed his Primary and High School Education in the Sirdar's High School, Belgaum, and joined the Bombay Veterinary College as a Government Scholar in 1901. He successfully completed his course and in the Diploma Examination, stood first and carried away prizes in Surgery, Best Studentship and the medal in Soundness of Animals. Immediately after graduation, he was placed in charge of the Poona City Dispensary which was opened a few months before. In Poona he had an ample scope for his professional skill and in a very short time he made himself popular both among the rich and the poor and the Dispensary almost topped the list of the Dispensaries in point of work in the Presidency, which position, the Dispensary still holds. The institution became popular under Mr. Marathe's care and the District Local Board had soon to build a big hospital which was completed in 1909. As a Veterinary Surgeon, he was soon spotted out as one of the ablest officers to hold high posts and he was promoted by selection to the Veterinary Inspector's post in 1910, and was placed in charge of the Revenue Southern Division of the Bombay Presidency with his head-quarters at Belgaum. While in charge of that Division he was instrumental in opening more Dispensaries and he organised several cattle shows in several places. It was he who first formed an Emergency Corps to deal with a widespread outbreak of Rinderpest in Dharwar District, where an extensive inoculation campaign was started which has made the preventive inoculations for ever popular in that District. He played no small part in organising the Bombay Civil Veterinary Department at the time of its provincialization. In 1915, he was transferred to Poona where he remained for nearly twelve years. In Poona Division he was successful in having more Dispensaries opened and took no small part in forming the Veterinary Section of the Presidency Agricultural Exhibition. In 1916, he did all the spade work of the present Cattle Breeding Operation in the Presidency and issued final premium bulls and organised village shows. During the great war, he had volunteered his services on Horse Transport Steamers.

In 1919-20 famine, he looked after several Cattle Camps both officially and unofficially and even while on leave, he worked on the Poona District Famine Relief Committee. As a result of his observations during Famine times, it struck him to make use of the Pinjrapoles as breeding and dairying centres and he wrote and published a note on Pinjrapoles and he has been ever since trying to induce the authorities to change their angle of vision and convert these institutions into useful institutions. His services were lent to the Bombay Pinjrapoles to set them in proper order from their deplorable state. In 1921, with great tact, he handled a severe outbreak of Glanders in horses in Poona when the political situation was tense with the Non-Co-operation Movement, the boycott of H. H. The Prince of Wales' visit to Poona and etc. The outbreak was the first of its kind in the history of the Bombay Civil Veterinary Department. In 1926, he was transferred to Ahmednagar for a short time, where he organised two Horse and Cattle Shows on a large scale. Since 1925, he acted as a Deputy Superintendent and as Deputy Director on several occasions and in 1934, he was confirmed in the latter post. In this capacity he was also Personal Assistant to the Director of Veterinary Services, Bombay. He retired in April 1937.

Prior to his retirement he was selected by the Baroda State to fill up the post of the head of the Baroda Civil Veterinary Department which post he has been holding since the beginning of 1937. His activities in professional matters in Poona are too well-known. He was the founder of the Cattle Improvement Association and Gopal Sangh in Poona. He was a Joint Honorary Secretary of the Poona S. P. C. A., and was responsible for equipping and running a Motor Veterinary Dispensary, the first of its kind in India. He is a Treasurer of the Poona Pinjrapoles. He contributed many professional articles to the press in Poona without allowing his name to be published. All these activities were recognised by the public, and at the eve of his departure to Baroda, he was presented with a farewell address enclosed in a Silver Casket on behalf of the Bombay Presidency Cattle Improvement Association, Gogras Gojivdan Mandal, Bombay Gogras Bhiksha and the Bombay Humanitarian League (published elsewhere in this issue).

On 31st December 1936, he was given a grand send-off by his colleagues and professional friends in the Bombay Presidency. He has taken a Diploma in Sanitary Engineering. He has been a recipient of the King George the V Silver Jubilee Medal.

His activities in the cause of Veterinary Association particularly of the Bombay Presidency Veterinary Medical Association are very well-known. They have been recognised by the profession by awarding him a Gold Medal during the Golden Jubilee Celebration of the Bombay Veterinary College.

He is a strict, impartial and straightforward Officer, who is never afraid of giving out his well considered opinion even at the risk of incurring the displeasure of his superiors. His subordinates in the Bombay Civil Veterinary Department held him in high esteem and freely sought his help in all their difficulties as they were sure of his generous help. He would not deny this help even to his enemies if any. He is a typical Maharashtra hospitable host of a jovial nature.

We are sure he will prove a real asset to the progressive State of Baroda in his new sphere of activities to cope with which he is very well-equipped.

RETIREMENTS.

*Retirement of a Veteran from the Civil Veterinary Department,
Hyderabad (Deccan).*

Dr. Ramachandra R. Joshi, a graduate of the Bombay Veterinary College, a Deputy Superintendent, Civil Veterinary Department, Hyderabad (Deccan), retired from service during the last winter. He is a Maharatta and was born in the Kolhapur State. He started private practice in these dominions as an enthusiastic pioneer as early as 1905. He did very well in those days of horse traffic.

The Nizam's Government having realised the necessity to have a Veterinary Hospital of their own, literally purchased the services of Dr. Joshi and his establishment which included a

well-equipped hospital and a shoeing forge. In addition to his being in charge of the main hospital in Hyderabad, he was called upon to attend on the animals of the Nizam's Palace and those of many nobles of Hyderabad.

He worked for several years in this capacity and interested himself in the Milk Problem of Hyderabad. He did his best in the prevailing circumstances to improve the milk in quantity, quality and for its production under hygienic conditions. He was the first to draw attention of the public to the development of the Dairy Industry in the Dominions, having made a special study of the subject to find out means of improving the situation.

His pamphlet "The Milk Problem of Hyderabad City" is the only one of its kind available to-day, suggesting the broad lines on which this industry can be improved. Dr. Joshi's work in this connection and his pamphlet were valuable references available to the British Dairy Expert who recently visited Hyderabad.

He was made a Deputy Superintendent in the year 1932, and his work in this capacity is a credit to him and to the Department, particularly in popularising the latest method of Goat-virus vaccination against Rinderpest in the field, a fact that has been acknowledged in the 'Review of Agricultural Operations in India 1931-33'.

At an 'At Home' given on the eve of his retirement a friend rightly remarked that Dr. Joshi's activities and work increased as his age advanced.

Though the retirement of this worthy servant is a loss to the Government service, it is an addition to the private enterprise and public life. We wish him a happy time in his well-earned retirement. He has already started "The Hyderabad Live-stock and Dairy Company". He is one of those who feel they must do something and be active but not sit idle.

A JUNIOR VET.

THE OLD PAL RETIRES.

Dr. N. K. Barsikar, G.B.V.C., Veterinary Inspector, Ahmednagar retired from the Civil Veterinary Department in October 1935 to enjoy his well-earned rest at Kolhapur his native place.

Born in 1880, Dr. Barsikar completed his Secondary Education at Kolhapur. After his Matriculation, he joined Government Postal Services, but being dissatisfied with the prospects there and having more liking for Veterinary profession, he joined the Bombay Veterinary College and won his Diploma as a graduate of the Bombay Veterinary College in 1906.

He also completed the Sanitary Surveyor's course and got its diploma. He was offered the post of the Resident Veterinary Officer in the College Hospital after his graduation and was later on appointed as Veterinary Assistant Surgeon at Sholapur. He served in that capacity in many places. Throughout his official career, he worked with such zeal and efficiency that he stamped his personality wherever he went and was extremely popular among the public.

His services were appreciated by the Department and he was promoted to the rank of Veterinary Inspector. He is gifted with a strong physique from his birth and he has developed it into the commanding personality which he now possesses by his regular and healthy habits. He has always been a good sportsman possessing an untiring energy, he not only managed his official work efficiently but also found time to write a valuable work on Animal Breeding and Management in Marathi. This book is spoken off highly in learned circle and is recognised by Government.

He desires to spend his happy retired life at Kolhapur. We wish him long life and peace in his retirement.

A WELL-WISHER.

Anatomical Section

FREAKS OF NATURE

BY

H. N. CHELVA IYENGAR, G.M.V.C.

Lecturer in Anatomy, Madras Veterinary College.

I. In A Chick: (Plate No. 48.) (Reference:—I. V. J.—Vol. XII—No. 1—July 1935—Page 33—Para 2). The owner of the chick brought it to the college hospital (September 1936) and handed it over to one of the dog-boys. Information as to its being born alive or dead was not available.

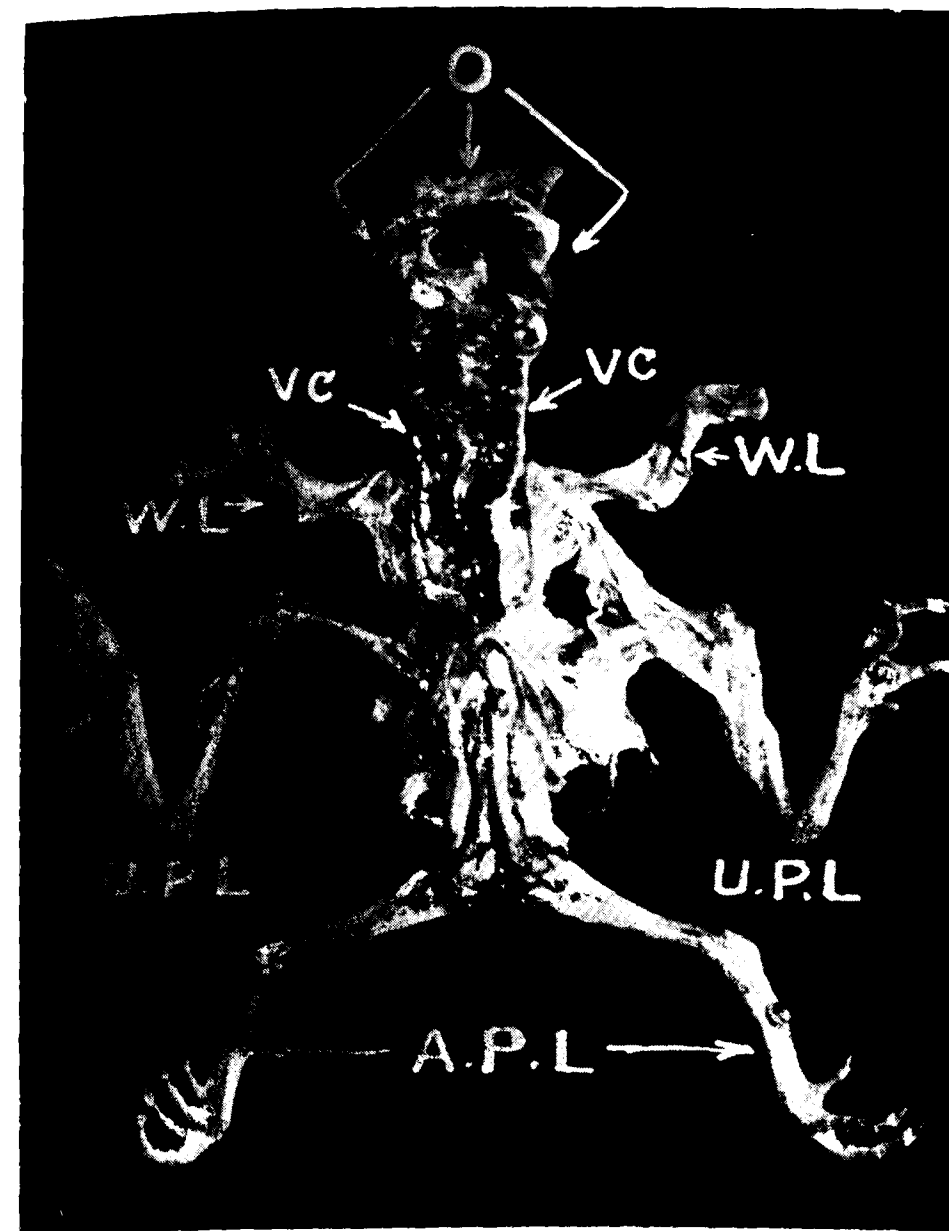
Note:—The freak on a superficial examination had to be classed as *Polymelians* but after rendering it transparent, the two divergent beaks with only one cranium and two vertebral columns became apparent. As it could not be classed under '*Dicranus Bispinalis*' for want of two distinct heads, the name "*Monocranus-Bispinalis-Polymelians*" has been adopted in order to indicate all the characteristic features of this freak.

Monocranus—Bispinalis—Polymelians.

The parts of the chick were putrid by the time I took charge of it, and the internal organs could not therefore be studied. It was fixed in 20% Formalin solution for 24 hours and was then rendered transparent.

Two heads were fused into one but two divergent faces (beaks) were present—one on either side of the median line. There were three orbits—One on either side of the median line and the third in the centre of the fused heads. There were two vertebral columns, only one pair of wing limbs and two pairs of pelvic limbs. The second pair of the unusual pelvic limbs were behind the normal pair. The two vertebral columns were far apart from each other in the cervical region but inclined towards each other at the middle of the dorsal region and then ran close together in the lumbar region.

II. In a kid: (Plate No. 51.) This freak, on a superficial examination with the skin intact, had to be classed under "*Dipygus*



(Author's) Plate No. 48. O: three orbits; V. C: two vertebral columns; W. L: wing limbs. U. P. L: usual pelvic limbs; A. P. L: two additional pelvic limbs.



(Author's) Plate No. 51.

Bilumbis teloccephalis". But, on dissection it was found that it would be more appropriate to class it as "*Dipygus Bidorsudis*".

This freak was secured in the slaughter house. When examined with the skin intact, the freak appeared as if it were a normal foetus (having a normal head, a neck, a trunk and four limbs) with an appendage in the form of two additional fore and two additional hind limbs attached to its thoracic portion. On a superficial examination, the appendage referred to looked as if it was attached on to what appeared to be the normal foetus, between its fore limbs, inclined more towards the right one. The appendage with its tail was directed towards the head of the apparent normal foetus.

The floor of each trunk showed its own *umbilical cord* which was composed of the usual structures. The disposition of the umbilical veins from these two umbilical cords will be referred to later.

Dissection.

Head: It had a single head. The single cranial cavity contained a *cerebrum*, a *cerebellum* and a *pons* but *two medulla oblongata*. There were *two spinal cords*—one in continuation with each medulla oblongata. This led to the suspicion that the neck might be different from what it looked. There was a single mouth, tongue, pharynx, larynx, trachea and oesophagus. It showed two ears, two orbits, two nostrils and two nasal chambers. Both the trachea and oesophagus descended on the median line between the inferior aspects of the two *necks*, the latter being directly attached to the upper face of the former all along the neck. There were two separate *Foramina magnum*. The *two atlas* of the two necks were found articulating with the single occipital bone. The usual position of the Foramen magnum had a thin plate of bone extending from the Basi-occipital to the supra-occipital. The positions of the two foramina magnum of this freak were at the place of the usual condyloid foramina.

Neck: On removal of the skin round what appeared to be a single neck, two longitudinal parallel ridges with a distinct groove between, were noticed on the dorsal aspect. Working down

this groove, it was found that there were two distinct equally developed necks. The opposing faces of the two necks were kept together by areolar tissue. Similarly, a longitudinal groove was noticed on the ventral median line of the apparent single neck. Muscles of the inferior cervical group (of the two necks) lying directly under the trachea were also kept together by areolar tissue. On separating this attachment, a single trachea with a single oesophagus above it (Trachea is usually found in relation with the longus colli—in the cervical region) was found running down along the ventral median line between the two necks. The two necks which were close together at the start showed a great divergence behind. On removal of the skin of the apparent normal foetus and its appendage, it became evident that there were two separate vertebral columns and the dorsal portion of each vertebral column of each foetus was twisted in an S-shaped manner. It also became evident that this freak had two distinct trunks each with its own fore and hind limbs. Hence, the classification—*Dipygus Bidorsualis*. The twisting of the spines of the two, made the thoracic and abdominal cavities of one foetus face those of the other. Hereafter the foetuses will be referred to as right and left ones. The anterior border of the right shoulder of the left foetus was opposed to the corresponding part of the right foetus and kept attached to each other by the extensions of the scapular fascia and the cutaneous muscle, at the dorsal median line (behind the level of the dorsal inter-cervical groove referred to). The whole was covered over by a common skin. Similarly, the left fore limb of the left foetus and the right fore limb of the right foetus were opposed at their shoulder joints and were kept attached by fascia, covered over by a common skin behind the ventral inter-cervical groove referred to.

Thoracic cavity:—On removing the attachments between the two fore limbs of the two foetuses, both above and below, the *proper thoracic cavity* of one was found united with the *proper thoracic cavity* of the other—thus forming a *common thoracic cavity* for both the foetuses. Each proper thoracic cavity had its own dorsal and lateral walls. But the right lateral wall of the right foetus and the left lateral wall of the left foetus met at a sternum between

them, to form the floor of the common thoracic cavity. The left lateral wall of the right foetus and the right lateral of the left foetus also met at a sternum between them, to form the roof of the common thoracic cavity.

Abdominal Cavity:—Each foetus had its own *Proper abdominal cavity*, each of which had its own dorsal and lateral walls. But the lateral walls of the two foetuses blended with each other from the Xiphoid region to a little in front of each naval. From this point backwards, the remaining portion of each abdomen with its hind limbs were separate. But the whole abdominal cavity was common to both the foetuses.

Diaphragm:—Each foetus had its own proper diaphragm each of which had a tendinous centre and a muscular rim. The right part of the left diaphragm and the left part of the right diaphragm extended and united to form an extensive partition between the common thoracic cavity in front and the common abdominal cavity behind. Thus, the united diaphragm also showed a tendinous part in its centre and a muscular part along its rim. The central portion of the united diaphragm showed in its centre a foramen—foramen sinistrum, for the oesophagus. Diaphragm of the right foetus showed the hiatus aorticus for the aorta and the foramen dextrum for the posterior vena cava. The diaphragm of the left foetus had the usual hiatus aorticus which transmitted both the aorta and the posterior vena cava. The hepatic trunk of the left liver pierced the left diaphragm at the usual position of the foramen dextrum. In other words, a large hepatic vein, coming out of the left liver passed through the foramen dextrum instead of the posterior vena cava.

Digestive System:—The oesophagus ran down the inter-cervical space, placing itself over the trachea and entered the inlet of the common thoracic cavity. It continued backwards along the median line of the roof of the common thoracic cavity, over the base of the heart and included in the mediastinum, crossed under the aortic arch of the left foetus, left the thoracic cavity through the foramen sinistrum, entered the abdominal cavity and terminated in *two stomachs*. Each stomach had the

first three compartments—the rumen, reticulum and omasum—completely distinct from the corresponding compartments of the other. The two abomasums of the two stomachs united together to form a *single fourth compartment* for both the foetuses. There were *two spleens*—one for each foetus, each being placed in contact with the supero-lateral aspect of each rumen. Two tubes started off from this common fourth compartment and each of these tubes represented the *intestines* of each foetus and were not well developed. There was a *pancreas* with reference to the beginning of each of the two tubes. There were two *livers*—that of the right foetus was much larger than that of the left.

The umbilical vein from each umbilical cord reached the umbilical fissure of the Right liver and there united. The *Common umbilical vein* thus formed entered the right liver.

Urino Genital System:—There were two *kidneys* in each foetus and the two *ureters* starting from these kidneys terminated as usual in the *bladder* of the corresponding foetus.

Both the foetuses were males. Each had a *penis* and a *prepuce*. The penis of the right foetus was shorter. Each foetus had two *testicles*. The right testicle of each foetus was behind its corresponding kidney in the sublumbar region but the left testicle of each had descended into the scrotal bag.

Respiratory System :—

The *trachea* ran down the ventral median line of the inter-cervical space with oesophagus related all along to its dorsal face. It entered the common thoracic cavity, continued its course backwards, separated itself from the oesophagus and gradually inclined towards the right. It then gave off an *apical bronchus* to the right lung of the right foetus and bifurcated at the base of the heart into *two bronchiæ*. The right bronchus entered the right lung of the left foetus and the left bronchus entered the right lung of the right foetus. The left lungs of the two foetuses, showed at their roots, the entrance and the exit of the pulmonary vessels only but no bronchiæ were found entering these lungs. There were two lungs for each foetus—right and left but there was only

Freaks of Nature

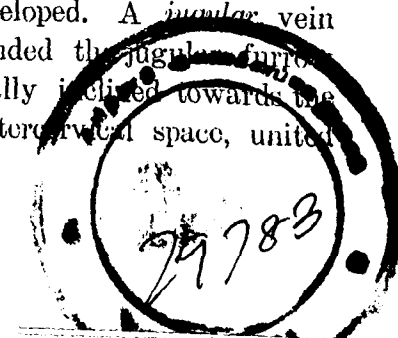
ore heart. This heart was included between the two right lungs of the two foetuses and the left lung of the left foetus. Each foetus had a *thymus*. Both these started from the base of the single heart. Each then reached the neck of that side foetus and extended as far as the thyroid.

Vascular System:—The *heart* was single and common to both the foetuses. It was placed on the median line of the common thoracic cavity.

Principal Veins:—The *posterior vena cava* of the *right foetus* was normal in its formation and position. It, as usual reached the border of the right liver and after receiving the hepatic veins passed through the foramen dextrum of the proper diaphragm of the right foetus, ran forwards in the thoracic cavity and then in the groove between the diaphragmatic and intermediate lobes of the right lung of the right foetus and finally terminated at the postero-inferior aspect of the right auricle.

The *posterior vena cava* of the *left foetus*, though normal for the most of its extent in the abdominal portion, did not descend to the border of the left liver but continued its relation with the posterior aorta, entered the thoracic cavity through the hiatus aorticus of the left proper diaphragm, and ran forwards placing itself above the aorta until it reached the level of the 7th dorsal vertebra. It here separated from the aorta, gradually inclined to the right of that vessel, crossed over the oesophagus and then was joined by the *hepatic trunk* from the left liver and a common trunk formed by the union of *axillary veins* from the left fore limb of the right foetus and the right fore limb of the left foetus. The posterior vena cava after receiving these tributaries crossed the median line of the common thoracic cavity, wound round the base of the heart to its right side and there joined the *anterior vena cava*.

The *internal jugulars* were not developed. A *jugular vein* coming from each side of the head descended the *jugular furrow* on the lateral aspect of each neck, gradually inclined towards the median line of the lower part of the inter-cervical space, united



with each other and with the *axillary veins* of the right fore limb of the right foetus and the left fore limb of the left foetus at the thoracic inlet and formed a single anterior vena cava which joined the terminal part of the posterior vena cava of the left foetus and formed a *common venous trunk*. This trunk opened into the supero-posterior aspect of the right auricle.

Principal Arteries:—The *common aorta* sprang from the left ventricle of the single heart and divided into three main arteries. Two of these were similar in size and larger than the third. Each one of the larger ones took a backward direction and became the *posterior aorta* of each foetus. The left posterior aorta detached at the same level *two axillary arteries* from its dorsal face to the left foetus. The right posterior aorta detached two axillary arteries to the right foetus. The third—the narrower division of the common aorta took a forward direction and became the *anterior aorta*.

The anterior aorta ran forwards placing itself on the median line of the common thoracic cavity, came out of it, ascended the inter-cervical space placing itself on the under surface of the trachea and divided into *two common carotid trunks*—right and left. Each one of these common carotid trunks ran across the trachea, gained the under face of the neck of each foetus, ran up gradually inclining to the lateral aspect of the neck, gained the corresponding side of the head and terminated in a trifurcation in its usual position. Each common carotid trunk was found related to the common cord of vagus and sympathetic.

Note:—1. The common carotid trunks were not related to the oesophagus.

2. There was only one carotid artery and one common cord of vagus and sympathetic with reference to each neck.

3. None of the axillary arteries were derived from the anterior aorta.

Clinical Articles.

CONCUSSION OF THE BRAIN AND SPINAL CORD IN A MARE CAUSED BY A FALL.

BY

SHAFI BAHADUR KHAN, G. V. Sc.,

Veterinary Assistant Surgeon, 2nd N.O.H.I.S. Lancers'

Veterinary Hospital, Hyderabad (Dn.)

On 12th April 1937, a chestnut mare, about 12 years of age was brought to the 2nd N. O. H. I. S. Lancers' Veterinary Hospital.

History:—She had a fall into the cemented water tank while drinking water.

Symptoms:—There was no external injury on any part of her body.

She was showing peculiar and alarming symptoms of trembling and shivering which increased considerably when any object, attendant or others approached her. The characteristic shivering was most pronounced in the posterior region. Her excitability and muscular tremors rendered her unmanageable and with the greatest difficulty could she be kept upon her legs.

The hind legs were abducted to a marked extent. The respirations were hurried and the animal had no temperature. There was complete loss of appetite.

Treatment:—The mare was stabled in a quiet loose box. She was given Mag. sulph VI oz. daily, and Pot. Bromide 1 oz., Pot. Iodide 2 drs. twice daily in drinking water which was placed at the level of her head, as it was the only possible mode of administration possible under the circumstances. She could drink water with great difficulty for the first three days of her sickness.

On 14th April, she showed no improvement. She perspired profusely and showed increased thirst.

On 15th and 16th April, the animal showed great excitement and progressive exhaustion.

On 17th April, the conjunctivæ were found congested but the shivering had decreased. The following ball was administered :—

R/

Aloin	...	2 drs.
Calomel	...	1 „
Excipient	...	Q.S.

The animal passed free motions.

On 18th April, she was allowed light exercise.

Perspiration and shivering ceased and the animal recovered.

From 14th to 18th April, the mare was administered Pot. Bromide and Pot. Iodide daily.

Later on the treatment was followed by nervine tonics.

The above treatment was adopted under the instructions of M. Karamullah Khan, M.R.C.V.S., B.V.Sc., Principal Veterinary Officer, H.E.H. the Nizam's Regular Forces.

A CASE OF KUMRI IN HYDERABAD (Dn).

BY

SYED NURUL MOHTEDA, G. M. V. C.,

Assistant Veterinary Surgeon, Sitarampet, Hyderabad (Dn).

The subject, a chestnut stallion 'Tasweer', aged 26, suffering from 'Kumri' was admitted in the Veterinary Hospital, Sitarampet, from one of the district stallion stands, for observation and treatment.

The animal was in good condition, but it kept its hind limbs wide apart while standing. When pressure was applied to the loins the animal flinched and evinced pain. The movement of limbs when walked was "groggy". When trotted there was swaying movements of the hind quarters. The animal felt difficulty in backing, and if forced, fell down. The same was true when made to turn rapidly. It was diagnosed as a case of Kumri.

As the treatment was found to be of no avail the animal was destroyed and post-mortem examination held. It revealed congestion of duodenum and cystic condition of kidneys. The liver was found studded with many white hard nodules, each about the size of a pea. A cancerous growth of the size of a tennis ball was found hanging in the folds of the mesentery. The brain and spinal cord (lumbar region) and a piece of liver were sent to the Muktesar Laboratory for histo-pathological examination. The following is the text of the report :—

"Brain showed slight congestion and endarteritis. No other abnormality. Spinal cord showed congestion and endarteritis in the piameter. Liver, a few worm nodules, (which may be due to *Schistosoma Indicum*) with evidence of inter-lobular cirrhosis around them, have been detected. Cancerous growth, myxo-fibroma".

This case has been reported because of the recent interesting observations made by Prof. Malkani (1933) on the subject, and our findings being identical with his.

IMPERFORATE ANUS?

BY

G. K. KULKARNI, G. B. V. C.,

Assistant Veterinary Surgeon, Ramdurg State.

History:—A bull calf, two days old, was admitted as an in patient on 18-9-36, with the history that there was no anal opening.

Symptoms:—The animal was straining to pass faeces.

Operation:—The seat of operation was anaesthetised locally. A disc of skin corresponding to the normal size of the anus was cut out, but there was no trace of the rectum. When I tried to dissect further, I found some bony tissue and a natural slit therein. A search for the end of the rectum was fruitless. The calf died on 23rd September 1936, and the post-mortem examination showed that nearly 6 to 8 inches of the bowel was dilated and was filled with liquid faeces and its posterior portion was found anastomosed with the urethra. This being a queer case I thought that it might interest the readers of this *Journal*. Hence this note.

FILARIA OCULI.

BY

M. ABDUL AZIZ KHAN, G.B.V.C., M.B.H.,

*Veterinary Assistant Surgeon, i/c Veterinary Dispensary,
Baheri, Bareilly, U.P.*

A horse, (O.P. No. 1373), property of Mr. A. W., Zamindar of the village Igra, was brought to the dispensary on 2-11-36, with the history that there has been continuous flow of water from its near eye since two days.

On examination a filarid worm was found actively moving in the eye and due to severe irritation, there was a slight opacity of the cornea. The owner was advised to feed the animal on low diet that night and to bring it early next morning for operation.

The animal was cast and secured. The affected eye was washed with Boric lotion and as there was no cocaine solution in the hospital the operation was conducted without using any local anæsthetic.

With the help of the fore finger and the thumb of left hand the eye was kept firmly opened, and with the point of a scalpel a puncture was made at the supero-posterior part of the sclero-corneal junction, a little towards the cornea. Immediately after the puncture the "Aqueous Humor" spurt out with some force, bringing with it half of the parasite outside, which was successfully pulled out with a pair of forceps and was preserved in the formalin solution.

After-Treatment:—Soon after the operation was completed the eye was again washed with boric lotion and the animal was let loose, with instructions to the owner to keep the animal in a well-ventilated and darkened stable. The owner was supplied with a freshly prepared 1/10 per cent. solution of acriflavine with instructions to instil a few drops of the solution in the affected eye twice daily. The animal was brought to the dispensary on 8-11-36, and on examination the eye was found normal.

USE OF DEODAR OIL IN VETERINARY PRACTICE. *

BY

RAM SWARUP, G. P. V. C., P. G.,

Veterinary Inspector, Sahranpur Circle, U. P.

Deodar oil is prepared from the wood of Deodar tree which grows in the Himalayas and is of a dark brown colour. The odour is pungent and characteristic. It can be had at Rs. 2-8-0 per gallon from Messrs. Santlal Prithisingh and Company, Paltan Bazar, Dehra Dun. I have used it as a dressing for skin diseases and also as an anthelmintic. For killing ticks in dogs, cattle and other animals, I have found it effective. It can be applied pure to destroy ticks and their nymphs within 24 hours. A second

* Read at the 9th All-India Veterinary Conference, Bombay, 1936.

application if required can be repeated after a week. The animal may be washed later with soap and water to remove the oil. Fleas and lice are destroyed by its use in a few hours. Deodar oil does not irritate the skin of dogs and cattle.

In mange, Sulphur 1 oz. Camphor 2 drs. may be mixed with Deodar oil 4 oz. and Coconut oil 4 oz. and applied every fourth day over the affected part after clipping the hair over the part and washing.

In Eczema, Zinc Sulph 1 oz. Camphor 1 dr. may be mixed with one ounce of Deodar oil and 4 oz. of Vaseline and applied to the affected parts.

In Catarrh and Cough in horses, Deodar oil 2 drs. may be administered as an electuary twice a day.

For ascarid worms in buffalo calves, Deodar oil 3 drs. Spirits Aetheris Nitrosi 2 drs. mixed with 4 to 6 oz. of linseed oil acts well as an anthelmintic.

DEATH OF A DOG AFTER AN ATTACK BY HONEY BEES.

BY

H. S. BAWA, M. R. C. V. S.,

Bhimtal, U. P.

It was in the morning at about 11 A.M., on 1st June 1936, at Ram Ganga Forest Bungalow in Kumaon Hills—a piece of ground was cleared of grass under the trees, and pegs were put in to chain seven dogs. In a short time after, the dogs were seen comfortably settled, a few honey bees were noticed hovering about the place. The men who were nearby, having had no experience before ran away to escape the bees and took shelter in the verandah; but the bees did not pursue the men. A large number of bees appeared and attacked the dogs making the poor dogs struggle for their lives as they were chained. Two men gathered up courage and under the cover of a blanket with smoking pieces of wood in their hands, released the dogs. As the dogs ran towards the verandah,

bees followed them and so the dogs had to be taken inside the wire gauzed rooms. Men were very badly stung on their hands. One noticeable feature observed was that the bees attacked mostly those dogs black in colour, their second choice being roan, while white dogs were left alone. There were two black dogs among the group and both were very badly stung.

Treatment :—By means of forceps as many stings as possible were removed from the sides of lips, tongue, ears and various parts of the body. As dogs were of black colour the stings could not be seen on the body. Lips and tongue were completely covered with stings. Dogs were stung on the tongue, because they in the frantic state tried to defend themselves by biting at the bees. One black Labrador which was stung very badly had a staggering gait and rapid respiration. Fits of convulsions were noticed at short intervals. Ammonium Chloride solution was used to swab the parts stung and internally Spts. Ammonia Aromaticus was administered. There was not much swelling at this stage. Temperature was 105°F and 104°F in both cases. The swellings were fomented with hot saline lotion. Both of these dogs tried to lap water every now and then. In the case of the black Labrador dog convulsions became worse, and at 4 P.M. his tongue was swollen and hanging out and great difficulty in breathing was present. At about 5 P.M., the dog died of asphyxia.

The second dog, Cocker pup did not show any convulsions, but was very dull and showed weakness of hind quarters. There was complete suspension of urine and faeces. He was given a dose of castor oil at 5 P.M., and his bowels moved at 6 P.M. Faeces were of very dark colour and very offensive in odour. The dog also passed urine satisfactorily. His temperature went down to 103°F. The heart beats were weak. He was fed hourly with egg flip containing brandy. In the morning of 2nd June, his temperature fell to 102°F but the pup was still very dull and was still hand-fed. On the 4th, he started taking some food himself and his temperature was normal.

On the 5th June, he showed all over his body and ears small areas of necrosis, in the centre of which were present stings of bees

which were not taken out on the first day, because they were not visible. Stings were taken out from these areas and careful cleaning and dressing healed them in two weeks.

I would very much like to know if any of my professional brethren have had similar experience and if so to publish them in this *Journal*.

ANTIMOSAN IN A CASE OF MICROFILARIA IN A DOG

BY

A. G. KAKA, G.B.V.C.,

Veterinary Assistant Surgeon, Jacobabad, Sind.

*Subject:—*A brown Spaniel.

*History:—*The dog belonged to Mr. C. N. S., Upper Sind, Frontier District and was brought to the dispensary for treatment. The owner stated that the dog was dull and was not feeding properly. The animal was not looking cheerful when walking.

*Symptoms:—*The dog had 103.6° F temperature on 3-10-1936, and he was suspected to be suffering from Piroplasmosis. He had eczema over the eye lids and the body. The blood smears were taken and submitted to the Director of Veterinary Services, Sind, for microscopical examination and numerous microfilariae were detected in the blood smears.

*Treatment:—*Mr. G. S. G. Haji, G.B.V.C., Officer in charge, Goat Virus producing Station, Karachi, suggested to me to treat the case with Sulfarsenol injection intramuscularly at the gluteal region as this drug had given good results in the treatment of filariasis in human beings at the hands of medical men. He also referred me to the article on filariasis in dogs in the *Indian Veterinary Journal*, Volume VIII. Several drugs had been tried in the treatment of this disease, but none was satisfactory. The owner was very keen about the treatment. The Director, Imperial Institute of Veterinary Research, Muktesar, was requested to suggest treatment by telegram and he suggested that Antimosan or Fuadin should be tried. The drug was not available locally

so it had to be sent for from Haverro Trading Company, Bombay. The first injection of Antimosan 6 c.c. was given intramuscularly at the gluteal region on 16-10-1936, and the blood was being examined daily. On the third day it was found that the microfilariae had decreased in number. Five more injections were given of 6 c.c. Antimosan intramuscularly over the same region at an interval of 4 days; after the fifth injection no filariae were detected in the blood and the animal was discharged cured on 11-11-1936.

The owner was transferred to Bombay and he met me in February 1937, and told me that his dog was quite alright and it has shinning coat and is very cheerful.

The treatment of Filariasis in dogs with Antimosan may be given a fair trial and the results may be communicated to the profession through the columns of this *Journal*.

First the body weight of the animal is taken and for every 10 lbs. of body weight 1 c.c. of Antimosan is injected. The dog weighed 60 lbs. and therefore was given 6 c.c. of Antimosan.

In conclusion, I may thank Mr. C. S. G. Haji, G.B.V.C., Officer in charge, Goat Virus producing Station, Karachi, for suggestions regarding the treatment. I also thank Mr. F. Ware, F.R.C.V.S., I.V.S., Director of Imperial Veterinary Research Institute, Muktesar, for suggesting me the best and successful treatment of filariasis with Antimosan.

[It is a pity that the blood of this dog was not examined at a later date to make sure that it was really cured. In the absence of this test one cannot pin his faith on Antimosan in the treatment of Filariasis in the dog. *Ed.—I.V.J.*]

A CASE OF COMBINED INFECTION OF DISTEMPER AND PIROPLASMOSIS IN A BITCH.

BY

M. C. PAUL, G. B. V. C.,

Stationary Veterinary Assistant Surgeon, Government Cattle Breeding Farm, Sylhet, Assam.

History:—On 16-6-36, Mr. P. Woodland, Manager, Lakhatumah Tea Estate sent for me to treat his bitch. I appeared therein at his bungalow. He narrated that his bitch is ailing since a week with fever, skin eruptions, discharge from eyes and loss of appetite. He further said that he has given the bitch some febrifuge mixture, but the bitch's condition is getting worse instead of getting improved. He further said that she passes high coloured urine and red stools, and vomits now and then. She had dysenteric faeces too and for a day had foaming at the mouth.

On examination I found the temperature 103.6° F, hurried respiration, weak heart, pulse quick and thready, no lesion on the lungs, m.m. of eyes and mouth icteric, discharge from eyes, distemper eruptions under the abdomen and thigh and innumerable ticks on her body.

I took blood smears and specimen of faeces and examined them under microscope. The faeces contained nothing abnormal but the blood smear showed piroplasmosis.

Treatment:—16-6-36. 2 c.c. Solu Salvarson subcutaneously, white lotion dabbing on the eruptions and application of Boro Zinc powder after that. A mixture containing Sodi Hyposulph, Sodi Salicylas, Liquor Ammon Acetas, Vinum Ipecac and Tr. Euonymin twice a day. Advised removal of ticks, dry cleaning of the body, warm comfortable bedding and Lactol as diet.

17-6-36. Temperature 102.4° F, other symptoms remained the same but there was tympany.

The owner wired for Omnadin (Vet) at my advice. He said that he procured distemper vaccine. This could not be used as the case was in advanced state. In addition to the mixture and

dressings, a dose of liquid paraffin was given to move the bowels and bicarbonate of soda to relieve tympany.

18-6-36. Temperature again rose to 105° F, her pulse being very weak, Tr. Digitalis was added to the mixture.

19-6-36. The temperature again came down to 102.8° F, but she totally refused food. There was offensive smell at the mouth. The tympany still continued. Instead of giving rectal feeding a dose of Spts. Ammon. Aromat and Adrenalin Chloride solution was given thrice a day before food to make her to take lactol. Mouth was washed with Hydrogen Peroxide. Bicarbonate of Soda was given to check tympany.

20-6-36. The bitch took some food. The temperature was 102.8° F, and the same treatment continued.

21-6-36. Omnadin arrived and 2 c.c. was injected intravenously. Temperature 102.8° F. The same treatment was carried on.

22-6-36. Temperature 102° F. The bitch showed considerable improvement and began to take food with some relish. The second dose of Omnadin was given. She was put on Ferri et Quinine Citras, acid Nitro Muriatic Dil and Tr. Nux Vomica.

24-6-36. Temperature normal, the skin eruptions healed up, solid diet allowed. The case was declared cured. The tonic mixture was allowed to be continued for a week.

NOTES ON RABIES.

BY

K. G. WARIYAR, G.M.V.C.,

Veterinary Surgeon, I/c Wadakanchery Hospital, Cochin State.

(1) A kid was brought to this hospital to be treated for impaction. When it was being drenched it bit the attender of this hospital. The owner then reported that the kid had received a bite from a dog a month before. So the animal was kept under observation for Rabies.

First day:—The animal took its feed well and drank a good deal of water also. There was nothing in the temper of the animal to create suspicion. By evening the purgative administered operated and the kid had three good motions.

Second day:—Every thing normal. Took food, drank water and the bowels moved.

Third day:—No change.

Fourth day:—Morning. There was salivation, and by noon the salivation became excessive, the animal refused food and water. Paralysis developed and the animal died at about 1-30 p. m.

The attender was sent to the Civil Hospital, Trichur, at once for anti-rabic treatment.

The brain of the animal could not be examined as the owner refused to have the brain removed.

Note:—The kid was not exhibiting any symptoms to create suspicion of its being rabid. If the owner had not made known that the kid had been bitten by a dog, the poor attender's life would have been jeopardised.

(2) A pup with a small abrasion on its neck, that was kept with a dog which afterwards died of suspected rabies, was brought to the hospital for advice and treatment. The owner being a Medical Practitioner consented to give the pup a course of anti-rabic treatment. Vaccine was obtained from Coonoor and the animal was given anti-rabic treatment for 7 days as directed.

The pup exhibited no symptoms of rabies till the 13th day after treatment. On the 14th day the animal became ferocious and showed symptoms of rabies of a violent type and the owner shot it. Information regarding this was given to the Director, Pasteur Institute, Coonoor.

Notes.

We invite the attention of our readers to the extracts published elsewhere in this issue from the resume of addresses presented at the 62nd Annual Meeting of the Ontario Veterinary Association and the Central Canada Veterinary Association in the months of February and April. We find in the Editorial columns "it is the aim of the Association:

To promote good fellowship in the profession.

To protect and promote the professional interests of the Veterinarians.

To elevate the standard of Veterinary education.

To direct public opinion regarding problems of animal hygiene.

These tenets may also serve as a guide to the individual members of the profession." (Italics are ours). These are good and great tenets for every Association and individual member of the profession.

* * * *

In his opening address to the All-India Cattle Conference, H. E. the Viceroy has well pointed out the sphere of work—though limited but highly important—of the Central Government in connection with the Live-stock industry of the country. He said "The subjects with which this conference is concerned, have for many years, lain within the provincial sphere of administration. The opportunities for service open to the Central Government are in the main limited to the fields of specialised instruction and research and the control and prevention of animal diseases. It is also the duty of the Centre to promote the exchange of information between province and province and to provide from time to time opportunity for the discussion of important problems and for the interchange of views of which the present occasion is, I venture to think, a happy example and let me hasten to add that not the least valuable outcome of such a gathering as this is that it affords guidance to the Central

Government as to the manner in which it can best serve the requirements of the whole country, acting upon the advice of the Imperial Council of Agricultural Research and of the Board of Agriculture and Animal Husbandry in India." His Excellency has briefly said what the Central Government have been doing in pursuance of this policy. We earnestly hope that the Central Government will continue to stick on to this plan of work for at least some substantial number of years.

His Excellency has been glad, no doubt, in his own modest way that in response to his appeal 1,322 bulls and Rs. 1,65,000 have been either presented or promised so far. But we are painfully aware that the country has fallen far short of its duty in this matter even when a sympathetic Viceroy has given us a noble and generous lead by his own contribution of breeding bulls and the cost of their maintenance. The country needs a large number of bulls and vast funds to maintain them. This is a field in which both the State and the citizen should work in co-operation contributing to the utmost extent towards the common good. Every one of us should seize this golden opportunity. Especially the members of the Veterinary profession who daily come in contact with the rich and the poor interested in animals should persuade the public to respond to this appeal and the public, forgetting the differences and difficulties, should respond to this noble call.

"A sum of Rs. 1,000 has been received for the rescue of valuable animals from the city buyers." This is again from the same opening address. Cows when dry but still in prime of youth, not only from cities and towns but even from interior villages are purchased by the city butchers or their agents for slaughter. This can be seen in any of the slaughter houses in the towns and cities. Every city and big town with such slaughter houses, should have funds to rescue such animals but at present very few towns have these funds and have been running either *Pinjrapoles* or *Gorakshanasalas*. These are organised and maintained by the orthodox type of persons from among the merchants, priests and

others. The modern and the English educated man has rarely interested himself in such animal rescue work. This movement should be further encouraged all over the country. Official help and patronage can further stimulate the tendency towards such rescue work.

The average Indian, especially the Hindu, abhors the idea of slaughtering cows whether dry or old or in prime of youth. The butcher or his agent is not able to purchase the animal directly from the owner for slaughter but he employs middle men of poor class whom he pays a small pittance of commission. The few *Gorakshanasalas* in the country find it difficult to cope with this rescue work as the butcher, once he knows this, puts a high price on such animals for rescue. The rescue work has therefore become a big problem in some places. The country should however be ever grateful to Lord Linlithgow who has forcibly drawn public attention to this noble kind of rescuing cows from the butcher. As he said he is not content with talking and he has done it himself and shown the way to others. May his efforts be crowned with success.

The *Pinjrapoles*, *Gorakshanasalas* and other cattle rescue homes have been doing not only rescue work but have been also doing much service to the community, distributing milk to the sick and the suffering and the babies either free or at nominal price according to the circumstances. Mahatma Gandhi has given many useful suggestions for the proper economic running of these institutions. These institutions and their promoters deserve all help from the public and the State. The State should more generously recognise the unostentatious workers in this field, with suitable award of titles, certificates, etc.

Registration of all stud bulls and castration of all scrub bulls should be strictly enforced by means of a regulation. This point has been strongly emphasised in these columns on several occasions and well pressed by the workers in the field. We are glad the recent Cattle Conference has also recognised this as a necessary

condition in any scheme of cattle improvement. We hope the authorities will quickly move in this direction, at least in areas where either private or state bulls are easily available.

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Some of the very useful breeds of cows such as the Punganur, etc., have practically become extinct. These Punganur cows, small in stature and less costly to maintain, are heavy milkers for their size. Attempts should be made to trace out such breeds, maintain and improve them.

* * * * *

The problem of fodder supply has not escaped the attention of the Viceroy. He has spoken at length on this subject at the Conference. What were once fine village pastures have disappeared either completely or partially and there is heavy pressure on what little still remains as common pasture lands. The old village institutions such as Elders—either communal or common—which were having a healthy check or control over either individual or collective action, in the interests of the public, have also disappeared and personal liberty and freedom are not properly used. For want of education, sense of duty either to oneself or to the community has not yet dawned in the place of vanished institutions. Proper leadership is a great desideratum in almost all the villages. The cumulative effect of all these has been responsible for unrestrained and indiscriminate use or rather abuse of common or communal property including the village pastures. Though it is not possible now to bring about the revival of old institutions, still it should be possible to control and improve the pastures through education or regulation or both. The expansion of these grazing areas is also an urgent necessity to meet the increasing demand for such grazing facilities in the place of the occupied pastures.

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In the areas under channel irrigation all the available land has been brought under cultivation. There is not an inch of space either for working or milking or dry animals to move about

even for ordinary exercise. Open areas are considered necessary for the preservation of the health of the people in a locality, especially, in towns and cities. Similarly plenty of open lands in the vicinity of the villages is necessary for cattle for their movements.

* * * * *

Growing of fodder crops and exotic grasses require to be introduced and encouraged extensively by the grant of concessions with regards to the supply of water assessment of rates on such lands. We would even suggest the award of certificates and prizes to persons who undertake to grow such crops and grasses. Here again personal contact between the high officers and leading ryots will soon help to bring about the desired results. What little has been done in the shape of propaganda and distribution of leaflets on the subject require to be substantially supplemented in the way we have suggested here. Unless such effective steps are taken, all the best intentions and efforts of even the Viceroy will not produce the necessary beneficial results.

* * * * *

H. E. the Governor of Orissa, Sir John Hubback is an old and experienced administrator in India. In the course of his message to the meeting of the executive committee of the Cattle Breeding Association, in November 1936, outlining a programme for the improvement of cattle breeding in Orissa, he said that it was essential that the Association should, in the main, work through the Veterinary service of the Government though the Agricultural department would help on the good work very materially by teaching the ryot how to grow more and better fodder. It was however the veterinary department *alone* that they had to look for help in selecting suitable bulls and in seeing that the greatest benefit was obtained.

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Who could question the truth of this wise statement of H.E. the Governor? Even the officers of the Livestock section of the Agricultural department in charge of the cattle breeding stations always seek the advice and services of the veterinary surgeon in

all matters of animal health or ill-health. It can safely be said that these Livestock officers are independent of the veterinary surgeon, only in so far as the cultivation of fodder and grasses are concerned. Yet the question remains to be solved by the authorities as to who is best fitted to be in charge of the Livestock industry. Sir John Hubback has well answered this point.

The wise planters in Malaya are interested to see that Indian labourers will permanently settle down there. To encourage this, it has been recommended by the committee appointed to find ways and means, that the Indian labourer should be given a hut, a plot of land to grow vegetables and *facilities for breeding livestock*. Much stress is laid on the latter as the livestock improvement will interest the Indian labourer very much since he can invest his savings in this industry which will pay him a good return. The committee shrewdly holds the view that India is still almost entirely an agricultural country and that Indians of all races, are, as to an enormous majority, country and not town people and are engaged in agriculture of one sort or another. With few exceptions, all races and all creeds in India take a great interest in cattle, altogether apart from the interest taken by Hindus from motives of religion and the estate population is almost entirely Hindu. The authorities in India should make note of this recognition on the part of Malay planters of all these facts and give also the necessary facilities to the people in this country for breeding and improving cattle as the planters in Malaya have proposed to do.

One of our Governors is optimistic enough to say that greater the facilities given to the Indian ryot to improve the breed of his animals, the greater will be the prosperity of the ryot and consequently greater will be the income to the government in the shape of income-tax. Yes, the prosperity of the ryot is the prosperity of the nation and of the State.

New schemes for the improvements of livestock in the rural parts are of late seen in the daily press from various provinces of

India. But we have not seen the quarterly and other periodical progress reports in the press, published anywhere in the country. We eagerly look forward for the progress reports of several schemes announced so far.

Our Indian readers may be aware of the longstanding useful custom of the gift of a cow on important religious occasions. A cow ordinarily forms part of dowry to the daughter among the well-to-do families. Among the agricultural and labour classes the important part of the dowry, if not the entire of it in some cases, is a few sheep or goats or a cow or a she-buffalo given to the daughter when she newly starts her home with her husband. This useful and ancient institution is still in vogue in many parts of the country though considerably deteriorated due to the economic and other causes. The woman and her children even to-day point out to the visitor with pride, such dowries which have developed into respectable herds of animals which contribute substantially to her otherwise slender income. A revival of this practice of dowry consisting of useful animals should be encouraged on a large scale and this can be usefully adopted even among the educated, in the place of the present ruinous system of costly presents and cash dowry.

An official of the Imperial Dairy at Bangalore was sent at Government expense to England to study the handling and processing of milk. Through the influence of the Government he was able to get special opportunities, ordinarily not available to others, to see the work carried on a large commercial scale. It is hoped that the experience of this officer will be utilised to train up many people in such work in this country since more widespread application of the principles of modern milk hygiene and organisation for supply of pure milk from the country to the towns and cities is needed. It is very unfortunate that our numerous specialists and experts, brought from outside and maintained here at a heavy cost, have not trained the people of this country in their business to take up their work when the time comes for them to go away on handsome pensions or bonuses.

Our readers may have seen the advertisements in our English contemporary, calling for applications for the post of Principal of the Bihar Veterinary College, Patna, and for an examination for the appointments of Indians to commissioned ranks in the Indian Army Veterinary Corps. Both these appointments are not intended for even the best of the brilliant graduates from any of the Veterinary Colleges in India! They are open only to the Members of the Royal College of Veterinary Surgeons in Great Britain and Ireland! The graduates from the Indian Veterinary Colleges, are not allowed even to appear for the competitive examination for appointment to the commissioned ranks. It is a sad commentary on the work of the British Veterinary experts in India, who are Principals of the Indian Veterinary Colleges, controlling the Indian Veterinary education now for fifty years and over, that the products of the Colleges so ably presided over by them, are not considered fit to fill these posts in the Army.

* * *

The members of the R. C. V. S., of whatever denomination of efficiency or intelligence and with no knowledge of the conditions of the country in which they have to serve, are considered fit immediately after they obtain their diploma, to fill the high positions in the various sections of Veterinary Services in India, whereas the claims of brilliant graduates of Indian Colleges with merit and experience needed for such post, are overlooked simply because they are not members of R. C. V. S., even though they may have had post-graduate training in foreign countries. We feel that parallels to such conditions do not exist in the Agricultural and other services in India and presumably elsewhere. We hope that this disability in the Veterinary Services will soon be removed for obvious reasons.

Extracts

DISEASE PREVENTION*

BY

F. B. HOLLINGSWORTH,

Ottawa.

In a picture dramatizing the works of Louis Pasteur, he was shown rendering dogs immune to rabies. A commission was appointed and engaged to find out if his results, and the same principle would be applicable to man. Just then an Alsatian woman and her family doctor brought her little lad, terribly bitten on the thighs, legs and hands by a mad dog, to Pasteur and asked for treatment. After consultation with his colleagues he decided to make the experiment. At first the injections of weak dilutions of the virus were given but day by day stronger virus was injected. A more dramatic situation can hardly be conceived and one can imagine the anxiety of Pasteur as the potency of the injection increased. Pasteur's biographer, Vallery-Radot, relates that he was going through a succession of hopes and fears. The treatment lasted ten days; the lad was cured of his wounds, did not develop the disease, and three months after Louis Pasteur described the case to the Academy of Science.

Lord Lister's work on antiseptic surgery was also demonstrated. His results and theories met with a mixed reception, some received them with welcome, others with scorn. Despite criticism and opposition his theory was proven, ultimately accepted and antiseptic surgery has probably saved more lives than have been lost on the battlefields of the world. It is perhaps no exaggeration to say that in no period of history has the prevention of disease, as laid down by these two great men, Pasteur and Lister, occupied so large a place in the thoughts of every progressive community. In the present day, this aim which is considered the greatest outstanding tendency, belongs to the activities that care for public health.

Public Health protection has however become so highly specialized and technical that it is treated as a separate branch of the municipal administration with its own organization and problems. Disease prevention is the guiding spirit in every branch of an efficient health department and no bureau of that organization assumes more responsibility in this direction than that having to do with the supervision of its food supply, especially milk and milk products. Safe milk is the objective desired by every well-informed health official and careful observations will prove beyond the question of any reasonable doubt that no disbursement of public funds brings greater return to the people of any community than the money expended for the promotion of health

in guarding against possible contamination of the milk supply. Practically every legal requirement in the protection and distribution of milk had its inception or its justification in the desire to prevent the spread of communicable disease through this medium. Even the laws, requiring certain standards for butter fat and total solids, do as much to prevent dilution with polluted water as to prohibit fraud.

The practice of scoring stables, the facilities for sterilizing milking utensils, cooling, methods of milking and handling, all went back to the well-founded belief that dirty milk was unsafe milk. It was unsafe not only because it was more likely to contain whatever specific germs of disease, such as typhoid, or diphtheria, which might be present among the handlers, but because it was quite certain to contain the germs or germ products that cause diarrhoea in infants and small children.

Laws have been enacted by far-sighted health officials, and trained persons labouring diligently in this field and have been instrumental in bringing the industry to its present important place in the minds of producer and distributor.

There is also an ever-increasing number of consumers who appreciate changed conditions. In the old days, men equipped with some, but not definite, knowledge of the requirements for pure milk were sent out to work what were then considered real hardships upon producer and dealer. Conditions found during these early inspections showed very little understanding of sanitary milk production.

Stables were small, ill-ventilated, and poorly lighted. Very little milk was properly cooled, and instances are recorded where consumers demanded warm milk because they believed it freshly drawn from the cow. Raw milk was dispensed from unsterilized cans and dumped into uncovered receptacles found on door steps. Dust and dirt raised by passing vehicles added to the sediment already contained in this usually contaminated product.

Pasteurization and tuberculin testing were said to be the fancies of ultra scientific minds and it was claimed that they would add greatly to the cost per quart. Infants often died from intestinal disorders and the cause was not then known and therefore not guarded against. Ignorance and apathy were impediments in the way of progress, and the early inspector was sometimes considered a nuisance when he was trying to correct unsanitary conditions and when he was bringing order out of chaos by the establishment of new ideas. The people of that day, and unfortunately some of the people of our day, detest new ideas for two reasons; first, because the new ideas compel the ossified brain to try to think and that is painful, and second, because the new idea threatens established ways and perhaps established incomes.

That the health of any community is dependent to a far greater degree, than is realized, upon the proper safeguarding of its milk supply is evidenced by low infant mortality and reduced number of cases of contagious diseases obtained in cities where inspection,

tuberculin testing, and pasteurization have been adopted by the health authorities. The infant death-rate has decreased over fifty per cent. since milk inspection was inaugurated in our city and at a financial cost of less than one cent a year per person. Co-operating with the members of the Local Board of Health and health officials are found progressive milk distributors who have installed at no little expense, plant equipment, the object of which is to make milk safe and to be delivered in sterile receptacles so that it may be satisfactory to the most exacting consumer. These are noticeable points of progress which in the old days seemed impossible of accomplishment. The present time however finds the intelligent dealer ready and willing to adopt every preventive measure that will bring health and happiness into the home.

The producer has also observed the trend of progress in the modern stable, the clean well-lighted and ventilated stable, the prompt cooling of milk and the application of the tuberculin test. A decided improvement in sanitary methods of production have been the farmer's contribution to the programme, instituted by the health department for safe pure milk.

Meat and food inspection was commended earlier than milk inspection and is more efficient at the present time. It is true that milk control involves unique difficulties, as milk is usually consumed twenty-four to forty-eight hours after production while meat and other foods are held for considerable periods. When meat and other foods are found unfit for consumption there is time enough to eliminate the offending lot but milk has been consumed by the time its quality has been determined.

In order to obtain the best results in the safeguarding of the milk supply of a community it is necessary that the Inspector should be thoroughly qualified for such an important position; for judgment means so much to public health. We are living in an age of prevention, and also know that prevention is better than cure. Public health is purchasable, as clean milk is a necessary food, especially to children, who need it to develop bone, muscle, teeth, etc. We cannot be too careful as to its quality. Care in production is likely to be associated with increased milk consumption. By education the consumption of milk may be increased with consequent benefit to the producer.

I thoroughly believe in sanitation and it must be emphasized that there are times when common sense should prevail. We must realize that the producer is the person upon whom the public depends for foods of various kinds, we must co-operate with him. He is human, as is the inspector. Simply because an unforeseen condition occurs it does not necessarily mean that a milk shipment must stop. Good judgment must be exercised. My sympathy is with the producer but I do not allow this to detract from common sense. Just because a hurricane happens in a farmer's district and a few milk houses are demolished in a few minutes, to have his supply cut off the next morning is

ridiculous. I thoroughly believe in censuring the producer when necessary, but we must remember the basic principle of any business is the Golden Rule.

The purpose of dairy inspection is to prevent sickness and save human lives, and by its efficiency in accomplishing these ends it must be judged. We must remember that we are not here for ourselves alone, but for others. With that ideal dairy inspection will be placed in its right category.

Last Fall I had the privilege of attending a meeting of the American Public Health Association and the International Association of Dairy and Milk Inspectors in Milwaukee, Wisconsin. Eloquent papers were read in regard to public health activities, especially in the Food and Drugs Section where the ideals of milk production and consumption were emphasized. It was shown that proper methods of dairy inspection had a great deal to do with the decline of infant mortality. It was also shown that the health department must be a leader in better milk production and in the care of milk from the time it leaves the cow until it is consumed. Milk must be made safe by inspection and pasteurization. Seeds of progress must be planted in soil that has been fertilized and cultivated by medical men and Veterinarians who can qualify in such a paramount undertaking as the production of clean milk. As the children are our best future assets—the child of to-day is the citizen of to-morrow—all energies expended on their development are worthwhile and this may be aided by competent, honest and fearless dairy inspection.

In conclusion education must go hand in hand with Federal, Provincial and Municipal regulations in the future development of food control. As in our public schools, the old system of using the rod freely has long since given way to better methods of teaching, so will the use of drastic legal action gradually become less necessary as an enlightened food industry utilizes better methods of manufacturing, handling and preparing foods. But just as the best results are obtained in schools where some form of discipline supplements the best method of teaching, so the highest results in the production of pure food in those cases where educational methods alone are not effective will be obtained when there is available sufficient legal power and adequate machinery to administer corrective discipline.

Resumé of Addresses:—62nd Annual Meeting of the Ontario Veterinary Association and Central Canada Veterinary Association 1936.

BACTERICIDAL ACTIVITY OF BLOWFLY MAGGOTS.

BY

RONALD GWATKIN AND MURRAY FALLIS,

Ontario Research Foundation, Toronto.

S. W. Simmons (Jour. Bacteriology, Sept. 1935) reported the presence of a bactericidal principle in excretions of surgical maggots, which he considered accounted in part for the beneficial action they exerted in wounds. W. Robinson, (Jour. Parasit. October 1935) also reported on the presence of allantoin in the excretions. This substance is a product of metabolism of the cell nucleus of both plants and animals, and its excretion into wounds is apparently another factor contributing to the healing effect obtained in maggot therapy. The work reported here deals with bactericidal activity *in vitro* and *in vivo*, toxicity, keeping quality, antigenic value, and other characteristics of washings from maggots of *Calliphora* sp. and in one instance *Lucilia* sp.

Washings of maggots of *Lucilia* sp. showed some bactericidal activity with *B. coli*, the only organism against which it was tried. Washings of maggots of *Calliphora* sp. showed bactericidal activity for *Staph. aureus*, *Strep. mastitidis* 2 strains of *Br. abortus*, *B. Coli* and *B. typhosus*. *Calliphora* sp. were successfully raised in the laboratory. For some undermentioned reason the bactericidal effect of maggots of the laboratory raised flies was not as great as that from maggots of the original flies. Maggot washings diluted 1:100 still showed bactericidal activity against the more easily killed bacteria. Liquid and dried samples, dropped in bactericidal activity on keeping, the former showing the greater loss. Washings from meat in which maggots had been grown had a distinct bactericidal activity, not as great as from the maggots, but washings from a control portion of meat without maggots had no bactericidal power. A suspension of maggots ground up after washing did not show any germicidal activity. Growing maggots in meat infected with *Br. abortus* did not increase the bactericidal activity of the washings against this organism. Filtration of the washing reduced, but did not entirely remove, bactericidal activity and toxicity. Intraperitoneal injections of washings were toxic for guinea-pigs. One c. c. of fresh lots of washings produced a rapid fall in temperature and death. Liquid and dry samples suffered a loss in toxicity as well as bactericidal power on keeping. A rabbit given intravenous injections of washings produced a serum which had complement binding power with the dried washings as antigen. The serum was used in protection experiments in guinea pigs and showed some protective power against maggot washings. Intraperitoneal injections of diluted maggot washings did not protect guinea-pigs against infection with *Br. abortus*, but there was slower agglutinin production in the treated animals, suggesting that some protective action had been exerted. The washings *in vitro* produced agglutination and hemolysis of guinea-pig erythrocytes.

Resumé of Addresses:—62nd Annual Meeting of the Ontario Veterinary Association and Central Canada Veterinary Association 1936.

PARASITES, THEIR CONTROL AND THE TREATMENT OF INFECTED ANIMALS.

BY

T. W. M. CAMERON.

Dr. T. W. M. Cameron, M. R. C. V. S., (Macdonald College, McGill University) gave an illustrated paper on the control of animal parasites with special reference to horses and cattle. He discussed in general terms the theoretical methods of control against all parasites, paying particular attention to methods of manure disposal and treatment, and then proceeded to consider the sclerostomes and bots of the horse and warbles of cattle.

Control of sclerostomes, he declared, centred around destruction of the adult worms in the horse by drugs and interruption of the free portion of the life-cycle. The most satisfactory drug was Oil of Chenopodium, with Carbon Tetrachloride as second choice and he advocated the use of the stomach tube in their administration, although either could be safely given in hard gelatine capsules, and suggested fall and mid-winter dosing. Methods of prevention included good stable sanitation, overhead feeding racks and correct manure disposal or treatment. In spring and summer when the animals were on pasture, he recommended light and mixed grazing, harrowing of pastures to spread out manure and especially giving the cleanest pastures to young stock.

There are at least three species of horses both in Canada and he drew attention to the differences in their morphology, habits and effects on horses. Carbon bisulphide is still the most satisfactory drug against bots and should be given without a purgative. Treatment should be given about a month after the first frost.

Warbles are the most important of the animal parasites attacking cattle in Canada and cause a yearly national loss of between ten and fifteen million dollars. Their control must be communal and legislation is essential, although this should follow, not precede, a popular demand. The larvæ can easily be destroyed in the warble stage by various means, of which application of Derris in some form, is the most satisfactory, and with a communal effort, the flies could be eradicated in a few years. He described the anti-warble campaigns in Denmark, Sweden, Germany and Russia and detailed an experimental campaign which had been carried out in the United States. Great Britain was introducing compulsory legislation this spring and similar legislation in Canada was ultimately inevitable. He urged the need for district surveys and strongly advocated that not only should the choice be under the direction of veterinarians, as such failures as had been reported abroad, were directly due to lay control and inspection.

Resume of Addresses :—62nd Annual Meeting of the Ontario Veterinary Association and Central Canada Veterinary Association 1936.

CAPTURE OF ELEPHANTS.

A Thrilling Sport.

BY Dr. V. I. MANNADIAR, Ph.D.

Capturing elephants is a fine sport, an excellent adventure and profitable too. The accompanying article describes how it is done in Malabar, the home of elephants in South India.

It's thrilling. And behind it there is money too. Seldom one finds adventure, excitement, and money all blended nicely in one. You find them all here. But it is not a game that everyone can indulge in. The Government have a department to capture these animals, train and sell them, and also some wealthy people with extensive tracts of forest lands.

It was a hot March morning; no breeze, no clouds. I had gone to the forests on inspection. My plan was to finish my work and return home for lunch.

I was carrying only a smooth bore double barrel gun with half a dozen cartridges and a loaded 22 automatic pistol. What I mean is, I was so unprepared for anything extraordinary. And things happen only when one least expects them.

A Capture.

I had gone a couple of miles into the interior of the forests. An excited forester was coming hurriedly towards me. Wishing me in the usual style, he stretched his hand out to stop the car.

"What's up, forester?"

"An elephant capture, sir. A tusker has fallen into one of our pits."

"Where?"

"On the other side of the hill, sir, near the waterfalls."

"Has he been secured?"

"Yes, sir. The pit has been covered. I have put a dozen watchmen too there under a guard and was going to the adjacent village to make other arrangements, and send the information to the headquarters. Would you like to go and see the captive now, sir?"

"Of course, I would. You can get on with your job and I'll look after myself."

This was quite unusual—a capture in that area at this part of the year.

Generally, during the summer months elephants retire to thick *shola* forests. They like cool climate with plenty of water and fodder. Hence, they are seldom found in the low valleys during the hot months.

Two Methods.

Before actually narrating my experience I may explain the methods adopted here for capturing wild elephants and some of their habits. Indian elephants are very intelligent and possess a keen sense of smell. They are very shrewd and often detect the well set up traps and the carefully covered pits and avoid them.

Two methods are adopted here for capturing these animals—the Keddah and the pitfall. Out of these two the former is very expensive which makes it possible only for ruling chiefs.

Let me deal with the other method, which is the usual one here in Malabar “the pitfall”.

In this operation the selection of the site is the most important thing. Whether in thick forests or grassy glades one can easily discover the beaten elephant tracts. These paths have to be noted by the intending capturer and pits dug on them, as the elephants seldom change their usual route. The pits should be eight feet square and eighteen feet deep. Great care should be taken to remove all the new earth from the site as soon as the digging is finished. The best thing is to throw it away, if possible, into a river or a stream. This wards off the slightest chance of rousing any suspicion on the part of the animals. If it is not possible the loose earth could be strewn all over the place at least a hundred yards away, and dried leaves spread over it. This is very important, lest the animals take scent and avoid that area.

The Covering.

Now comes the next stage, the covering. Firstly, some hay and leaves are put into each pit to act as a cushion. A pole of about three to four inches in diameter is fixed across the mouth of the pit, upon which the elephant's neck usually falls while descending. On either side of this pole thin bamboos are spread which are again covered with earth and leaves. Of course, during the fall, the pole breaks under the weight, but helps the animal to maintain better level and to land safely on the cushion below. Paddy and some other grains are sown right round as a bait to invite the animals.

Now to resume my story. We had a good four miles to walk to get to the pit-site, over rocks, boulders and thorns. It is not at all pleasant to do it after the sun has got a little up, and especially when there is a steep hill to negotiate.

Steep Ascent.

Well, anyway, leaving the car we started. I had a friend also with me. The trees had shed their leaves and the ascent was steep; no shade, no water. Charged with thrill and excitement, we marched mindless of the burning sun.

We had covered three-quarters of the distance. There was a rivulet to be crossed which ran at this spot as a fine water-fall. It was very inviting and as we were so tired, we resolved to take a five minutes rest. By the roaring falls, we sat under the cool shade of a big tree.

A *Malaya* (a hill tribesman) was coming downhill at a good pace. I shouted for him and he came to us panting.

“Where are you going? Isn't the animal safe?” I asked.

“Yes, sir, but the herd is nearby and it may be that they may come to rescue the calf any moment.

“In this broad-daylight?”

“They may, sir, for we have never seen the herd so near a captive, during day. And we are only a dozen men there. I thought I might run up to the adjacent *pathi* (village) and get some rockets and help.”

I may add here that in this part of the world rockets are generally used to frighten wild elephants away in the absence of better things.

“All right,” I said and we started to the pit-site. We had covered about a furlong when we were met by another *Malaya* coming down. It seems he had seen us coming up and had come to warn us that the herd was moving direct to the pit-site, and it would be safer for us to wait a little before we went up.

He was right and there was only one thing to be done now—to wait.

Three Captives.

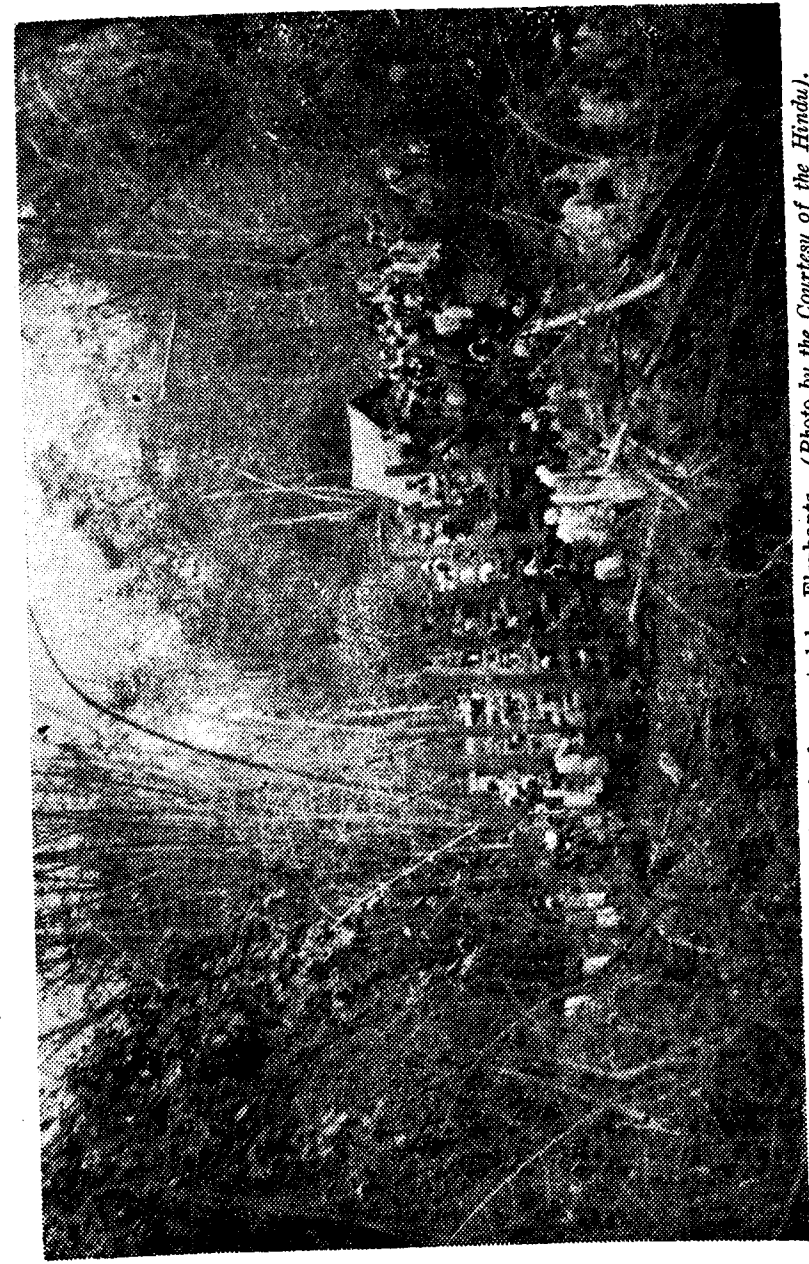
The pit-site was not far-off. There was a rock nearby and I climbed to the top to see what was happening. I saw a mother, a calf and a tusker all moving towards the pits! The watchmen had scrambled up to the top of some trees and were shouting and yelling from there. The animals approached the pits in a steady walk, bent upon rescuing the calf. Poor creatures, they did not know about the ingenious traps that were set for them, and down fell the mother and the calf into two nearby pits!

But the tusker did not wait. He turned back shrieking and trumpeting and bolted off into the jungle. It was all quiet again except for the shrieks of the captives, and the shouts of the watchers. We must go to the spot now. It was hard to leave a dozen men without any arms there. We were four and had a gun and a pistol—anyway, better equipped than those over there.

In less than ten minutes we got to the site. Meanwhile, about twenty *Malayas* from an adjacent village too had come down. They had heard the hubub and had come to help.



The captive being led to his new home. (Photo by the Courtesy of the Hindu).



The camp in the midst of the Jungle frequented by Elephants. (Photo by the Courtesy of the Hindu).

Covering the pits.

Soon we were engaged in cutting timber to cover the pits. In a couple of hours we had the mouth of the pits covered with big logs of timber, lest the animals might escape. They pull down the earth with their tusks, trunk and feet and fill the pits and come out easily. A small 'pandal' or canopy also was erected over each pit to protect the animals from the heat of the day.

It was well over 4-30 by the time we had finished all this work. It had been a tough day for us.

And the animals too were tired. They had fought hard to make good their escape—hitting at the sides of the pits and trying to push away with their trunks the logs of timber that came one by one over the mouths of the pits diminishing their chances of escape. They were now resigned to their fate and were getting quieter. It was our business now to give them food and drink—they were supplied with water, and tender bamboo leaves and grass were thrown into the pits for them to eat.

That finished, I had a cool bath and a drink from a rivulet nearby. Meanwhile, a party of *Malayas* had put up a couple of sheds and my boy had brought food and my camping kit.

The evening set in. Incandescent lanterns and campfires took the place of "will-o-the wisps" and forest fires. The jungle men were making merry, singing and dancing, their shrill pipes and peculiar drums giving it a weird touch.

We had earned our rest and were eager to have it. By 9 o'clock all of us had finished our dinner and gone to bed. The *Malayas* were watching the pits by turns.

It was midnight. I was roused from my slumber by the shouts of the watchers. Snatching the loaded rifle, I jumped out to see what the confusion was. The *Malayas* were busy sending-off rockets, the fireworks going up hissing and lighting their way with a shower of yellow sparks.

An Unsuccessful Attempt.

There was a crash through the forest. I could hear the shrieks of an elephant as it broke through the thick jungle. He had tried a last chance to rescue the captives.

I returned to my shed and lit a cigarette and lounged for half an hour admiring and wondering at the love these animals have towards their brethren.

The rest of the night passed off without any more incidents.

With the morning we had to tuck up our sleeves. Ropes had to be made. Each elephant had to be secured with three big ropes of a special kind of very strong fibre, called 'Ana Vakkai', one for each hind leg and one for the neck. We had to make in all nine ropes of at least twenty feet in length, three inches in thickness and a dozen or more smaller ones called the 'Kadi Vakkai', one end to be tied to the neck rope of the captive and the other to be held by the decoy elephant. It was settled to lead the two calves to our headquarters, twenty miles away.

The mother was a big animal. When once outside the pit she would give fight to regain her liberty as usual, and we may lose her. It was not possible to take her out and march her to any place right away safely. So a big 'karal' (shed) was put up quite close to the pit, so that she may not escape, but automatically enter it, when the pit is filled.

The decoy elephant arrived by the evening. Our arrangements were ready and it was fixed to take the calf out early the next day.

Noosing.

The third day morning saw our head elephant keeper noosing the calf. It requires great skill. The animal has to be coaxed to raise his trunk. Some fruits or, preferably, a piece of sugarcane is shown to him and as he brings up his trunk to grasp it, the opportunity is taken and the noose lowered down. The most difficult part is fastening the noose lest it may get tightened and strangle the animal. The state of the noose, whether it is too tight or too loose, has to be ascertained by actually feeling it with one's hand and it is a dangerous job.

Roping the legs is not so dangerous, but is extremely difficult. The noose is lowered to the bottom of the pit and the animal is made to step into it. The rope is then pulled up and the noose tightened. No fastening is necessary in this operation, as it doesn't matter even if it gets a bit tight.

Filling up the pit.

As soon as the noosing is finished the logs of timber covering the pit is filled up with earth and leaves. Automatically the animals come up. The neck rope is held by the decoy elephant. If he is a well-trained one, he will never leave it till the captive is in the 'karal' safe. Both the leg ropes are held by men, but if the new-comer is a troublesome fellow, one of the ropes is given to another decoy elephant. Some captives give fight as soon as they are outside the pit, but the decoy elephant quiets him by coaxing or frightening him. He caresses him with his trunks, and if these tactics fail, aims with his tusks or gives a tap with his trunk, but never harms his quarrelsome brother.

We secured the elephant by about eleven and marched him to our head-quarters and by nightfall we had him in our 'karal'.

Imprisoned in the "Karal".

Once inside the 'karal' the ropes are cut. The captive is more free and hits hard at the strong posts of timber and cross-bars. A few hours pass like that and he resigns himself to his fate.

The other calf too shared the same fate, but the mother was brought out only after a fortnight.

The next day the keeper enters the 'karal'. Before entering, however, the 'karal' is divided into two by a couple of beams put across which rest on the cross-bars.



The pit with the captive inside secured by big logs of wood and protected by a "Pandal". (Photo by the Courtesy of the Hindu).

The elephant is given a bath and a good feed. He is an intelligent animal and he soon knows his trainer. He likes him and obeys him.

In training, kindness pays a lot. The animal should not be beaten or goaded. It pays better to keep him in fear of being beaten rather than doing it. Of course, once in a way the stick should be used, but what I say is, it is better to use it as sparingly as possible.

In two or three months time the animal learns to obey the keeper and is brought out, a trained one, fit to be loved, trusted and worked.

Hindu, November 22, 1936.

IMPROVEMENT OF CATTLE.**Plea For Scientific Foundation****VICEROY'S ADDRESS AT SIMLA CONFERENCE**

SIMLA, May 25.

The importance of livestock improvement was stressed by His Excellency the Viceroy opening the Cattle Conference at Simla to-day. His Excellency delivered the following address :—

"Gentlemen,—Let me first of all assure you how happy I am to welcome you all to this Conference and to the Headquarters of my Government. The purpose of this gathering is that we may take counsel together upon the question of what may best be done in order to promote an early improvement and development of the livestock industry throughout India, in other words to consider what practical steps can be taken to secure the better breeding and feeding of Indian cattle.

"The subjects with which this Conference is concerned have, for many years, lain within the provincial sphere of administration. The opportunities for service open to the Central Government are now in the main limited to the fields of specialised instruction and research and the control and prevention of animal diseases. It is also the duty of the Centre to promote the exchange of information between province and province and to provide from time to time opportunity for the discussion of important problems and for the interchange of views of which the present occasion is, I venture to think, a happy example and let me hasten to add that not the least valuable outcome of such a gathering as this is that it affords guidance to the Central Government as to the manner in which it can best serve the requirements of the whole country, acting upon the advice of the Imperial Council of Agricultural Research and of the Board of Agriculture and Animal Husbandry in India. Our equipment for this work has recently been extended by the strengthening of the central institution for animal research, while as Sir Jagdish Prasad has told you, our proposals for a central institution for higher veterinary instruction are now assuming definite shape.

Importance of the bullock.

"Gentlemen, it is not necessary that I should remind an audience such as this that the ox is the foundation of India's agriculture. Indeed, I am aware of no other single contribution which it lies within our power to make towards the enhancement of the agricultural wealth of this country, which in its potential value is, in any degree, comparable with the general improvement of livestock. It has been calculated that the total annual cash value of livestock in India, if we include the annual value of cattle, labour, produce, manure and other products is of the order of Rs. 1,300 crores. That, no doubt, is an approximate

figure, but it serves at least to indicate the immense values at issue and the scope afforded in this direction for the enhancement of the country's wealth. And here let me say that while cattle must be the chief concern of this meeting, many of the proposals which may result from your deliberations will be applicable to other branches of the industry, such as sheep and goat breeding, both in my opinion deserving of and certain to repay in full measure the early attention of the departments concerned, while wool production, the hides and skin industry and in some provinces horse breeding may well derive benefit as a consequence of your labours. It is impossible to overstate the importance to the agriculturists of India of an adequate supply of good working bullocks, for the bullock is practically the source of power available to the cultivator, whether for cultivation, for transport or for the lifting of irrigation water. Nor need I emphasise the value of cattle manure, of the importance of the place which cattle dung, used as fuel, still holds in the domestic economy of a large proportion of the rural population.

"Much as we may regret that fact, the great importance of milk production, whether produced by the cow or the buffalo from the point of view of the country at large as well as from that of the cultivator himself is now widely recognised. The facts as regards the average consumption of milk and milk products per head of the population, so far as these are at present available, go to show that while there is great variation in this matter as between region and region and between household and household even in the same village, there is no doubt that the average consumption of dairy produce is too low, more particularly when it is remembered that we are dealing with a country in which the diet of human beings is so largely vegetarian and in which there is, therefore, a special need for such protective animal foods as milk, ghee and curds. In this matter of developing the production and distribution of milk and milk products, we look forward to the report of Dr. N. C. Wright, Director of the Hannah Dairy Research Institute, who recently spent 5 months in India examining our problems.

"For the development, on sound lines, of animal husbandry as a whole and the cattle industry in particular a scientific foundation is required and the Central Government have recently given special consideration to the requirements of the country in this respect. Additions have been made to the Imperial Veterinary Research Institute and well-equipped sections for animal nutrition and poultry research have been provided at the Izatnagar branch of the Institute. When the section on animal genetics has been added, the Institute will compare favourably with similar institutes in other parts of the world. The function of a central institute of this kind is to promote cattle improvement and the control of disease in the provinces, but it will at once be obvious that unless suitable organisations exist in the provinces which are capable of co-operating fully with the experts maintained at the central institution, much of the labour at the centre may be wasted and the ryot will fail to obtain the full measure of help which he needs. As I have already said, this is a provincial question and each province has its own special requirements and limitations, but

it seems desirable that we should take counsel together in this all-important matter for it is abundantly clear that if any thing adequate is to be done for the improvement of cattle in India, more technical staff of every grade is needed and above all continuity in breeding policy.

"I am indeed glad to tell you that the response to my appeal for breeding bulls and for funds with which to purchase and maintain them has been highly gratifying. The position at present is that, in addition, to a number of collective donations as many as 1,073 individuals have responded to my appeal with donations of either animals or money. No fewer than 1,322 bulls have been presented or promised while the cash subscriptions which have been offered amount in all to no less a sum than Rs. 1,65,000. In addition, a sum of Rs. 1,000 has been received for the rescue of valuable animals from city buyers. This response has been a very great encouragement to me for I am convinced that better sires must be the foundation of our policy of breed improvement but let me remind you that better bulls can only be the first step.

Pedigree Books

"It is essential, if real and lasting benefits are to accrue, that the bulls should be adequately maintained. The question of opening a cattle improvement fund in each province is therefore a matter in which I take the keenest interest. The purpose of these organisations would be the provision of adequate financial resources, the creation of an organisation devoted to the proper care and maintenance of all approved stud bulls and ultimately, I hope, the provision of further suitable animals. The art of breed improvement must inevitably be founded upon the accurate recording of pedigrees. The Imperial Council of Agricultural Research, with the co-operation of the appropriate provincial departments, has undertaken the establishment of pedigree herd books for the principal milch cow breeds of India and as a first step has set up a small committee for the definition of breed characteristics.

"This is a type of work which I greatly hope may be much more fully developed provincially, not only by the establishment of provincial Pedigree Herd Books for the most important draught breeds, but also by a more extensive system of registration of all the stock produced from "gift" and other good sires. The fact must be faced that, laborious as such registration may be, it is essential if the continuous improvement in Indian cattle is to be secured. Without the registration of progeny and of their performances even a very extensive system of distribution of stud bulls may easily fail to make any lasting impression on the cattle of the country. A method well devised and faithfully pursued through a long series of years is essential to the achievement of complete success.

Problem of Fodder

"Let me, at this stage, assure you that I have at all times in mind the excellent work on cattle breeding that has already been carried out

mainly by provincial departments—work which in many districts has already yielded a rich return in the share of a general improvement in the local breeds. Unless cows, calves and bullocks are to be fed better than is at present case, efforts to improve breeding will obviously be of little avail. And I am glad to note that two of the four items on the agenda of this conference deal with this aspect of cattle improvement. The provision of better grazing and the greater production of suitable fodder crops are two separate but closely related aspects of this great problem. The former was discussed at length by the Board of Agriculture and Animal Husbandry at Madras last December, their task being greatly lightened by the labours of a most important preliminary conference of Forest Officers which has done much to clarify the position as regards the forest grazing and the utilisation of waste land. The Board have made some important recommendation both as to the better utilisation of the existing grazing areas and the possibility of converting land at present waste into useful pastures.

Grasses of India

"In this connection it is my personal opinion that further research and experimental work on the grasses of India and the possibility of acclimatizing useful exotic fodder grasses are matters deserving of early attention. India is not a pastoral country, as judged by the usual standards of temperate climates. Nevertheless, the improvement of the grazing lands and an increase in their extent might do much to raise the general standard of the working cattle of the country. In most areas, however, the grazing must be supplemented by other foods and for the actual feeding of a very large percentage of our animals we must depend on the straws of cereal crops and on fodder crops. The time has come when there must be deliberate crop-planning for increased fodder crop production. Without anticipating the discussion on this subject it may be said that, if the additional resources placed at the cultivators' disposal by the improved varieties of staple crops and by improved irrigation facilities are wisely used, there is scope for a much larger production of fodder crops, especially leguminous crops, in a manner which would mean a gradual and steady rise in the efficiency of the cultivator and his cattle. The proposal of the Board of Agriculture and Animal Husbandry, that each province should set up a Grazing and Fodder Committee linked up with a Central Sub-Committee under the Imperial Council of Agricultural Research will be submitted for your consideration as a practical way of making a start and at the same time of arranging for an interchange of information and experience. I cannot overstate my sense of the vital importance to India of this question of animal nutrition for I believe it to be true to say that an essential step towards the better nourishment of man must be to improve the food supply of his animals.

"Let me end as I began, by affirming my profound conviction that we can make no greater contribution towards the welfare of the cultivator than by promoting the improvement of cattle throughout India. Let me also assure you that success in this endeavour is within our reach but competence technically, administratively and financially. If we can and come to a right policy and if we persist in our endeavours, public

opinion and the enthusiasm of the agriculturists are with us in no uncertain measure. Let us devote ourselves to this great purpose with high courage and unswerving devotion. I am confident that you, by your labours in this Conference, will make a most material contribution towards the advancement of animal husbandry in India.

The Hindu, 25-5-37.

INDIA'S CATTLE.

The need for sustained effort being made in the direction of improving the country's cattle cannot be over-emphasised. His Excellency Lord Linlithgow, in his address to the Conference in Simla, dealt with the main aspects of the question. "It is not necessary", he said, "that I should remind an audience, such as this, that the ox is the foundation of India's agriculture. Indeed, I am aware of no other single contribution which it is within our power to make towards the enhancement of the agricultural wealth of this country, which, in its potential value is in any degree comparable with the general improvement of livestock." Lord Linlithgow added that "while cattle must be the chief concern of this meeting, many of the proposals which may result from your deliberations will be applicable to other branches of the industry, such as, sheep and goat breeding, both in my opinion deserving of and certain to repay in a full measure the early attention of the departments concerned." The necessity of energetic steps being taken to improve the breed of Indian cattle was referred to at some length by His Excellency. According to him, the response to the appeal for breeding bulls and for funds with which to purchase and maintain them, has been "highly gratifying". Cash subscriptions offered for the purpose, we note, amount to Rs. 1,65,000 while 1,322 bulls have been presented or promised. While the figures may not give much ground for satisfaction considering the vast extent of the field to be covered, we trust the efforts of those interested in the question will make scientific breeding of cattle more popular ere long.

One of the topics which engaged the attention of the delegates was the starting of Provincial Cattle Improvement Funds. The discussion on the subject served to show that the main obstacle to a move forward is lack of finance. The Madras Government delegate pressed for a generous subvention from the centre, duly supported by his colleagues from the Punjab, Bihar, Orissa, Bombay, and the United Provinces. Given the best will in the world, it is obvious, an advance worth the name in this sphere, in other directions, is impossible unless the money needed is found. The scheme cannot be deemed to be financially sound, if one were to depend on "doles" for its working. While the provinces, with their limited funds, will not be in a position to meet all the expenditure, assistance from the centre cannot be forthcoming in the requisite measure without a thorough overhaul of the system of central finance. Popular enthusiasm should be roused, but this cannot be done without the public being assured that the Government mean business,

It should not also be forgotten that a programme for cattle uplift should go hand-in-hand with a well conceived plan to help the ryot to regain his feet. Unless he is in a position to take good care of his cattle, there is not much use in teaching him the essentials of the science.

The frank discussions at the Conference have disclosed the nature of the obstacles to be overcome if the movement is to be the success it deserves to be. But, there is no ground for undue pessimism. Provided both the public and the Government devote sufficient attention to the question with a determination to effect the necessary improvements, success in the field will be well within reach.—*Hindu Leaderette*, 26-5-37.

FUNDS FOR CATTLE IMPROVEMENT

Provinces Ask For Help

SIMLA CONFERENCE DISCUSSIONS

(FROM OUR CORRESPONDENT.)

SIMLA, May 25.

There was some plain speaking in the opening stages of the All-India Cattle Conference which met in the Council Chamber of the Viceregal Lodge.

Sir Jagdish Prasad, in a happily worded speech, paid a warm tribute to the Viceroy's genuine interest in all aspects of Indian agriculture and attributed the recent awakening to its importance to His Excellency's noble precept. He claimed credit for the reorganisation of the Imperial Research Institute at Muktesar and the steps for bringing shortly into being an institution for imparting higher education in veterinary science.

His Excellency the Viceroy, in opening the Conference, stressed the importance of providing opportunities for exchange of information and views and limiting the functions of the centre to fields of specialised instruction, research, control and prevention of animal diseases. In saying this, His Excellency probably did not realise how freely the representatives of the newly autonomous provinces would utilise the platform afforded them to make it clear to the Government of India that good intentions without financial resources led nowhere.

After the Viceroy's inaugural address, came the discussion on the first item on the agenda, namely building up cattle improvement funds in each province. Sir Bryce Burt threw out a suggestion for the celebration of a cattle improvement day and the collection of one pice from each person for the purpose. Mr. M. C. Rajah, who was the first to initiate discussion, frankly stated that the response in Madras to His Excellency's appeal for donations towards cattle improvement was disappointing, both in stud bulls and cash and as for the maintenance fund he said, with the obvious approval of his colleagues from other

provinces, that the Government of India should find the money. Sir Chhoturam claimed on behalf of the Punjab that it led in this matter of encouraging cattle breeding, but its resources had dried up and provincial finances being dependent on inelastic sources of revenue, he supported Mr. Rajah's plea for assistance from the Centre. Other Ministers, pucca, as well as interim, took up the cry for help, the Orissa representative raising a laugh by his description of the province as consisting of the tail-ends of three bigger provinces and suffering in consequence neglect in an exaggerated form.

Little did Sir Jagdish Prasad and those representing the Imperial Council of Agricultural Research who sat beside him realise that at this Conference, the first to be held since the new Constitution was inaugurated, so much feeling would be expressed against the Government of India's treatment of the provinces in the matter of distribution of financial resources. One wished that Sir James Grigg had been present to listen to these speeches. But apart from the Finance Member, it is good that Simla should realise the rest of the country is moving, for the smug complacency in which it is enwrapped deserves to be rudely shaken. If interim Ministers can speak in such tones, what will the Congress say when it assumes office is the question which went round while these speeches were being made.

THE PROCEEDINGS

Sir Jagdish Prasad's Speech

(ASSOCIATED PRESS OF INDIA.)

SIMLA, May 25.

Strong condemnation of malpractices against milch cattle in India was voiced by the Hon'ble Sir Jagdish Prasad, member in charge of Department of Education, Health and Lands, in his preliminary speech, requesting the Viceroy to inaugurate the All-India Cattle Conference in the Council Chamber of the Viceroy's House. Over 80 delegates representing the various Provincial Governments and Indian States were present. The Conference began at 11-30 a. m.

Sir Jagdish Prasad, at the outset, extended a warm welcome to the Ministers from the Provinces and the representatives of the Indian States, representatives of the Government of India, experts and distinguished non-officials who had assembled to concert measures for improving India's Livestock. Addressing His Excellency, Sir Jagdish said that this was a subject to which he had given the much needed prominence both by notable precept and praiseworthy example. The Viceroy's first message to the people of India gave a vivid picture of the problem, namely that the cow and the working bullock carried on their patient backs the whole structure of Indian agriculture. His Excellency's encouragement of pedigree cattle had rightly touched the imagination

of the Indian people and this had the right response throughout the country. The Viceroy's efforts in rescuing dry cattle from the cities was looked upon as a move in the right direction. In short, His Excellency's wide interest in cattle improvement had stimulated public interest, had encouraged their efforts in that direction and had heartened those silent workers who had been working silently in this field.

Continuing Sir Jagdish Prasad said that in a country like India where religious sentiments predominated, it was somewhat a sad reflection that abstract veneration should yield only to such practical neglect. It was well-known that in some Indian cities, malpractices on cows were practised which were a stigma on humanity. He hoped that public opinion would assert itself, so that these abominable practices would cease. It was clear that mere sentiment by itself, could not solve the problem which required for its proper solution scientific knowledge, organisation and a consistent policy pursued over a number of years to achieve well-defined results. He stressed the importance of the conference which was fully representative of British as well as Indian India to decide a comprehensive policy.

Sir Jagdish reviewed briefly the steps taken by the Government for the improvement of the Livestock, such as the establishment of various research stations and especially the appointment of the Animal Husbandry expert, Sir John Olver and Mr. Ware, who were both honoured recently by the conferment of titles as recognition of their services. The Government proposed shortly to start a nutrition research branch and poultry station at Izzatnagar in the United Provinces. Still a great deal remained to be accomplished. In a predominantly agricultural country like India, a large number of qualified workers were needed and it was naturally a handicap that a large number had to go abroad for higher qualifications. He hoped that in the near future they would establish the necessary institutions here to enable young men to train themselves in higher courses of veterinary science and other correlated subjects. To-day's conference gave them an opportunity for exchange of views and interchange of experience and enabled laymen and experts to meet together. Furthermore, it enabled the Government of India to realise the varying needs of the provinces. Sir Jagdish Prasad hoped that it would also provide a corrective to shifting policy and haphazard action. The task before the conference, though arduous, was fortunately untouched by any political controversy and he had every hope that the labours of the conference would yield much permanent value to the country. (Applause).

The Viceroy then declared the Conference open.

Appeal for Financial Help.

After the departure of His Excellency, the Conference assembled to transact business, with Sir Jagdish Prasad in the chair.

Sir Bryce Burt explained the implications of the proposal to set up suitable provincial cattle improvement funds on the lines suggested by

the Animal Husbandry wing of the Board of Agriculture as the best means of following the Viceroy's campaign for providing breeding bulls. He pointed out that there was a move towards the formation of provincial funds in most of the provinces of India. Such an organisation would utilise the available money to the best possible advantage. He urged upon the conference to consider particularly the relation of the organisation with the Minister of Agriculture.

Rao Bahadur M. C. Rajah, Minister of Madras, regretted that the response to the Viceroy's appeal had been disappointing in Madras, where only 20 bulls and Rs. 3,000 were donated. He appealed to the Government of India to make generous donations if they really wanted improvement in cattle breeding.

This appeal to the Government of India was supported by Ministers from the Punjab, Bihar, Orissa and Bombay, while the Minister of the United Provinces hoped that if such contribution was made by the Central Government, his province would get its share.

Sir Chotturam from the Punjab asserted that in the matter of improving the breed of cattle, his province was probably the first in India, with an expenditure of about Rs. 20 lakhs a year.

Orissa's woes were ventilated by the Minister, Mr. Patnaik, who pointed out that there was not even enough milk for children to drink in his province, while hardly any money was left under the subvention of Rs. 40 lakhs for nation-building services.

Sir S. T. Kambli from Bombay claimed that his province contributed Rs. 61,000 to the Viceroy's Fund and asked the Government of India to set aside one crore of rupees to provide the nucleus to the provincial cattle improvement fund.

Raja Maheswar Dayal, Minister of the United Provinces, suggested the formation of a provincial association consisting of 25 members which would give practical effect to the proposal under discussion. He estimated that in the U. P., at least 3,000 breeding bulls would be required for twelve years to achieve a reasonable standard of cattle.

Grazing was free in the U. P., the cost of maintenance of these bulls would be trifling. Therefore the problem, so far as the U. P. was concerned, was only of supplying the requisite number of bulls,

Mr. B. G. Khaparde, Central Provinces Minister, said that 289 bulls were purchased in the Central Provinces since the Viceroy's appeal out of both Government funds and private donations. He hoped that as time passed, the benefits of the movement would be fully realised and a more generous response from the public was anticipated. He put in a special plea that the Government of India should be more generous towards the smaller provinces.

The Conference adjourned for lunch which was given by the Viceroy to meet the delegates.

The Conference reassembled after lunch and several members participated in the discussion on the proposal for setting up suitable provincial cattle improvement funds.

Gift Bulls.

Mr. Ware, expert of the Imperial Council of Agricultural Research, suggested that gift bulls should be approved by the Livestock Department before they are accepted. If this was agreed to, he hoped that the public would get rid of sentiment and also to Brahmini bulls approved and used for breeding purpose. He also urged uniformity of policy in respect of distribution of grants for the maintenance of bulls.

Dr. Badami (Hyderabad) urged that veterinary aid should be provided side by side with the improvement of cattle.

Colonel Noel (Frontier) and Mr. Kerr (Bengal) suggested a cess on cattle for obtaining funds for cattle-breeding.

Mr. Jenkins (Bombay) emphasised that the official agency should take up control of these organs for the improvement of livestock and should not depend on free and charitable agencies. He felt that legislation would be necessary before registration of Brahmini bulls.

Mr. Narayana Aiyar (Travancore) explained that owing to the abnormal rainfall in Travancore and Malabar, the problem of cattle improvement was quite different from the rest of India. He hoped that the Imperial Council of Agricultural Research would take this aspect of the problem into view.

The Nawab of Dacca (Bengal) wished that the Government of India had continued their rural grant which would have been very helpful in propagating their scheme.

Sir Bryce Burt, summing up the discussion, said that there was a good deal of agreement on the three main points put before the Conference. It was agreed on all hands that there should be established in Provinces and States, cattle improvement funds on a permanent basis, with both private and Government aid. From the practice prevalent in most countries, it was evident that the Government alone could not go far in regard to this problem. However, he had every hope that with the starting of provincial cattle improvement funds and organisations there would be greater and greater public support forthcoming. In every province, these livestock boards or associations should have the Minister as its President and other officers of the relevant departments should be closely connected with it for active help and guidance. Such organisations should also have the enthusiastic support of the district. On questions of maintenance and registration, Sir Bryce Burt said that these agencies, when established, would be

able to deal with them suitably. Several speakers had appealed for financial aid from the Central Government and on this question he was not in a position to say whether the Government of India would be prepared to make any contribution towards this work.

Sir Bryce Burt suggested that an Animal Day should be held annually in India, every person being asked to contribute at least one pice towards the Animal Fund. He reckoned that this would bring in half a crore of rupees.

Sir Jagdish Prasad adjourned the Conference till 10 a.m. to-morrow when the draft resolution on to-day's discussion will be placed before the Conference for adoption.

THE HINDU 26-5-37.

Improving India's Livestock Lines of work chalked out.

SIMLA CONFERENCE DECISIONS.

SIMLA, MAY 27.

Sir Jagdish Prasad proved as admirable Chairman of the Cattle Conference as he was the ideal host at a party given at his residence at the conclusion of the Conference. Everyone agreed that he had enabled the Conference to get through the agenda expeditiously by his tact and ready wit.

The question of the Government of India finding the necessary funds for the maintenance of breeding bulls came up again yesterday and Ministers insisted that the point must find a place in the text of the resolution. Sir Jagdish agreed but warned the Conference it would not commit the Government of India. Then the resolution was also not binding on provincial Governments, retorted Mr. Patnaik, Orissa's interim Minister, amidst general laughter. But Provincial Autonomy has certainly created a new relationship between the provinces and the centre which has found strong expression and representatives of the Government of India have been slow to take note of it.

At the party, Sir Jagdish Prasad performed the pleasant duty of investing Mr. K. N. Dikshit, acting Director-General of Archaeology, with the insignia of Rao Bahadur and paid a great tribute to his scholarship and distinguished services in the cause of archaeological research in India.

The Programme

The Cattle Conference reassembled to-day and concluded session this afternoon. Three more items on the agenda were discussed.

Mr. Smythies initiated discussion on the question of improvement for grass lands and better utilisation of waste and surplus land for fodder production and steps to be taken in that direction by the various appropriate agencies.

In the discussion that ensued Dr. Burns, Agricultural Expert of the Imperial Council of Agricultural Research, and Ministers and representatives of the various Governments participated. Speakers explained that the conditions prevailing in their respective parts of the country in the matter of fodder supply and exercise of control over grazing lands and the steps taken at various times in regard to the improvement of grazing quality of grass, etc. It was generally felt that they could not come to a single all-India solution at a conference like the present but that the subject should have to be examined carefully provincially to suit local conditions. To obtain adequate control, a properly constituted organisation was suggested by various speakers.

The suggestion was also made that as the subject under discussion was at present very largely a matter for further investigation and research, it deserved special and sympathetic consideration by the Imperial Council of Agricultural Research for the next few years and the Central Government should seriously consider providing finance. Dr. Burns in particular appealed for scientific planning, co-operation and continuity in whatever schemes evolved.

Another subject discussed was the possibility of crop planning for increased fodder production with special reference to leguminous fodders.

On the question of the need for increased technical personnel required for livestock improvement work throughout India, Mr. Ware expert of the Imperial Council of Agricultural Research, explained in detail the proposal to organise a body of stockmen in the countryside. The difficulty, however, he said, was finance. He gave figures of veterinary and other staff in the various provinces and said that they were totally inadequate in view of the immensity of the problem. Furthermore their staff doing livestock improvement work would be able not only to look after control of disease among the cattle but also help in the matter of livestock improvement generally with this object in view they should have to establish necessary training centres to turn out a useful body of willing, efficient workers to tackle one of the most vital problems of India.

Provincial Funds

The Conference, before adjourning, adopted the following resolutions on the various subjects discussed yesterday and to-day.

1. The Conference, having noted the response to H. E. the Viceroy's appeal for the provision of funds for the purchase and maintenance of approved breeding bulls, being convinced of the necessity for sustained effort to improve Indian livestock and of the importance of continuity of policy in all livestock breeding, considers it desirable that—

“(a) there should be established in each province a provincial livestock improvement fund into which would be paid donations or

other moneys received for the purchase and maintenance of breeding bulls and other forms of livestock welfare purposes. It is a sound principle that most money should be spent in the district in which it was collected;

“(b) there should be set up in each province either a provincial livestock improvement board with suitable district or local committees or a provincial livestock improvement association with district branches. It would be for each province to decide what form of organisation to adopt. It would largely rest with district and local committees or branches to maintain local enthusiasm and raise further funds; and

“(c) there should be the closest possible liaison between the several Ministries of Agriculture and such boards and associations. The precise composition and functions of these bodies is a matter for the provinces to determine but it is desirable that the Minister should be President except where that position is occupied by the Governor of the Province in which event, the Minister would be Vice-President. It would be an advantage if such bodies included in their membership, permanent officials connected with livestock improvement. Provincial livestock improvement boards would not undertake administrative functions. The Conference noted the unanimous opinion of Provincial Ministers that the Central Government should make substantial grants to provincial livestock improvement funds.”

2. The Conference endorses the recommendation of the Livestock Improvement Sub-Committee of the Board of Agriculture and Animal Husbandry that adequate and suitable provision should be made for proper maintenance in such manner as may best suit local conditions of all breeding bulls which may be presented in the future.

Grazing Facilities

3. With a view to securing systematic and progressive improvement in grazing and grass land areas and conversion of waste land into useful grazing wherever that is possible on an economic basis, the Conference recommends (i) that in all provinces standing fodder and grazing committees should be established on lines recommended by the Board of Agriculture and Animal Husbandry in India and (ii) that a Central Committee to co-ordinate grass and fodder research and dissemination of information should be set up by the Imperial Council of Agricultural Research.

4. Whilst recognising that conditions vary greatly in the different provinces and localities, the Conference is agreed upon the following general conclusions:

(a) the report of the Special Committee on Forest Grazing shows that contrary to popular belief, this is not only a reserved forest problem but even more a problem of waste lands;

(b) that great improvement in the existing grass lands is possible by controlling periods during which individual areas are open to grazing and by limiting the number and species admitted. Without such

control deterioration is progressive and frequently the poorest livestock are found where grazing is unrestricted;

(c) that good grazing is essential for the production of hardy young stock, especially draught breeds, and is, therefore, of special importance in all definite livestock breeding areas;

(d) that it has already been shown by experiment that under control, several types of waste land can be improved to yield an appreciable amount of grazing and hay;

(e) that there is scope for such useful experimental work on grass land improvement in many parts of India and that definite schemes of experimental work should be initiated by Provincial and Central Fodder and Grazing Committees and by the Forests Department in forest lands.

Staff

5. It is also suggested for the consideration of the provinces that the best possible use should be made of the existing staff and, in particular, that in those provinces which have not completely provincialised their veterinary staffs, there should be clear division of responsibility for veterinary work. Local bodies might be responsible for the maintenance of veterinary hospitals for the treatment of ordinary diseases and casualties and should retain control of Veterinary Assistant Surgeons required for that purpose. The rest of Veterinary Assistant Surgeons would form the disease control staff at the disposal of the Directors of Veterinary Services and these assistants could render substantial assistance to livestock improvement work.

6. The Conference is convinced of the need in every province for a livestock division with separate allotment of funds for livestock improvement work and controlled by a livestock expert whose whole time is devoted to that subject. It is probably that the ultimate solution in each province will be found in the eventual establishment of a unified department under one Minister, embracing plant industry, animal industry, control and prevention of animal diseases and marketing of crop and animal products and rural co-operation, with technical heads for the appropriate divisions.

7. Additional staff of all grades is required for livestock work and much can be done by the creation of a class of trained stockmen—provided that the head of the livestock division has an adequate supervising staff.

8. The Conference, being convinced of the need for great attention to the improvement of fodder and its best use and for deliberate crop planning directed to greater production of fodder crops, recommends that such special efforts should be made and such planning should form part of regular propaganda by the agricultural staff in all provinces. Details must vary greatly with local conditions but the fullest advantage should be taken of all favourable opportunities such as art afforded by the spread of high yielding varieties, cash crops and development of more intensive cultivation, due to new irrigation facilities.

Bringing the Conference to a close, Sir Jagdish Prasad, Chairman, said that the proceedings of the Conference would be forwarded to the Indian States who also participated in the deliberations for their guidance as well. He thanked the Ministers of the Provinces, their official and non-official advisers and representatives of States for having participated in the Conference and hoped that two days' deliberations might produce important results and that there would be marked improvement in the livestock of the country in the not distant future. Sir Jagdish felt it unnecessary to stress the importance of the problem but sincerely believed that Ministers and other representatives would translate into practice all knowledge acquired from the useful exchange of views.

Several delegates reciprocated the Chairman's remarks after which the Conference dispersed.

"At Home" To Delegates

Kunwar Sir Jagdish Prasad gave an at Home at his residence this evening to meet members of the Cattle Conference. Besides all delegates to the Conference, there were present members of the Governor-General's Executive Council, Secretaries of the Government of India, officers of the Department of Education, Health and Lands and of the Imperial Council of Agricultural Research.

LIVESTOCK CENSUS IN INDIA

Decrease in Bulls in Madras

COMPARISON WITH FOREIGN COUNTRIES

SIMLA, Oct. 1931

The report on the fourth Census of Livestock in India, which has just been published, shows that there were in British India, excluding Bengal and Bihar and Orissa, 113 million head of bovine cattle made up roughly of about 84 million head of oxen and 29 million head of buffaloes. The total figure for this census is over five millions or about 5 per cent higher than that recorded at the preceding census (says a press note issued by the Director of Public Information, Simla).

Oxen accounted for an increase of 27 millions and buffaloes for an increase of 2.5 millions. In the case of oxen, there was an increase of a little over three millions in young stock, but bulls and bullocks showed a decrease of about half a million, the reduction occurring mainly in Madras.

Cows recorded a decrease of over a lakh, the decline occurring mainly in the Central Provinces and Berar.

Both male and cow buffaloes increased in number, the former by nearly a quarter of a million and the latter by little over half a million, the variations occurring mainly in the United Provinces and the Punjab.

Sheep declined in number by over half a million, the notable decreases being in Madras, the United Provinces, the Central Provinces and Berar.

Goats numbered 26 millions, showing an increase of over one million, as compared with the previous census,—the noticeable increases being in the United Provinces and the Punjab.

There were no appreciable variations in the total number of horses and ponies, but donkeys increased by about a lakh. Mules numbered 65,000 and camels a little over half a million.

Ploughs and carts gave a return of 17 and five millions respectively, showing a slight increase (mainly in the United Provinces) as compared with the previous census figures.

The total number of sugarcane crushers (worked by power and bullocks), oil engines with pumps for irrigation purposes, electric pumps for tube wells and tractors as reported in the present census were 457,000, 10,000 and 7,000 respectively.

Conditions in States

A considerably larger number of Indian States participated in the present census than in the previous one, and this gradual increase in the area covered renders impossible any comparison with the totals recorded at the previous census. The figures of the present census relate to about 66 per cent of the total area of Indian States as compared with 50 per cent compared by the preceding census. Information, therefore, is still incomplete so far as the Indian States are concerned. The present census gives a return for the Indian States of nearly 54½ million for bovine cattle, consisting of nearly 42 million oxen and 12½ million buffaloes, 18 million for sheep, a little over 15½ million for goats, nearly three quarters of a million for horses and ponies, nearly 13,500 for mules, over half a million for donkeys, and nearly half a million for camels. Ploughs found in the Indian States number nearly 6½ million, carts a little over two million, sugarcane crushers (worked by power and bullocks) nearly half a million, oil engines with pumps for irrigation purposes nearly 3,000, electric pumps for the tube wells nearly 1,200, and tractors also 1,200.

Figures for Foreign Countries

It is interesting to note here, for purposes of comparison, the figures for livestock wealth in some of the more important of the foreign countries as recorded in the latest census, which in Great Britain, Australia, New Zealand and Argentine took place in 1934, and in the rest in 1935. The figures are as follows, and are given in the nearest millions:

	Cattle (Oxen.)	Sheep.	Horses
Great Britain and Northern Ireland ...	9	25	1
France ...	15½	9½	3
Netherlands ...	2½	7	3
Germany ...	19	4	3½
		(exclusive of army horses).	
U. S. A. ...	60½	50	12
Canada ...	9	3½	3
Australia ...	14	113	2
New Zealand ...	4½	29	3
Argentine ...	31	39½	Not available.

The next preceding census of livestock in these countries took place in 1930, and a comparison with the returns at that census shows that all these countries with the exception of Canada and Argentine, where have been decreases by 1·3 per cent and 4·2 per cent respectively, record an increase in their cattle wealth. The most notable increase has been in the case of Australia, namely by 19·9 per cent. New Zealand comes next with 14·1 per cent, Great Britain and Northern Ireland follow with 12·7 per cent and Netherlands with 11·5 per cent. The increases in the case of France, Germany and U. S. A. have been 1·3, 2·4 and 1·6 per cent respectively. For sheep, too, Great Britain, Netherlands, Germany and Australia record an increase by 1·1, 40·2, 12·0, and 2·2 per cent respectively. In the other countries named there have been decreases. For horses, all these countries show a decline, the greatest decline being in the case of the United States of America, by 13·6 per cent, Canada coming next with 11 per cent, and Great Britain and Northern Ireland third with 7·1 per cent. It appears that Denmark, Roumania, and Norway are the only countries which record an increase in the number of their horses by 2·4, 12·4 and 3·3 per cent respectively.

History of the Census

The idea of taking a livestock census in India dates back to 1916, when the Government of India, after consulting local Governments and administrations, decided that a census of cattle should be taken throughout British India between December 1919 and April 1920, and that this census should be repeated quinquennially thereafter. The Indian States were also invited to hold similar census simultaneously with the British Provinces. The first all-India census was accordingly held generally in the cold weather of 1919-20, and the second during the same period of 1924-25. It was felt that the period of enumeration at these censuses, namely from December to April, was too wide and that the value of the results obtained was possibly vitiated to some extent by the inter-provincial movements of cattle. The desirability of holding the census simultaneously throughout India was also stressed by the

Royal Commission on Agriculture. The third census was therefore held generally in January 1933. The fourth census, which is the latest and the figures of which have been given above, was, with some important exceptions, held in January 1935, but two Provinces, namely Bengal and Bihar and Orissa, were not able to participate at all in this census, mainly owing to financial reasons. The results set forth are, therefore, to some extent incomplete.

A revised classification of livestock was adopted for this census with a view to obtaining more complete information than was available under the previous classification and to avoid lack of uniformity in the enumeration of the different kinds of livestock. Provision was also made in the revised classification for additional information relating to agricultural implements and machinery, such as iron ploughs, oil engines for irrigation purposes, electric pumps for tube wells, tractors and sugarcane crushers. The collection of this information was, however, left optional. Burma among the British Indian Provinces found itself unable to adopt a revised classification of livestock; there was also a slight departure from the standard classification in the case of the United Provinces. The revised classification was followed as far as possible by most of the Indian States, but some found it necessary to adhere to the old classification.

Hindu 5-10-36.

AGRICULTURAL JOTTINGS

Cattle Breeding

HINDU 9-2-37.

A dairyman or ryot who owns a herd of cows and supplies milk all the year round to his customers has to regulate the calving of his cows throughout the year to fulfil his orders and keep up a uniform supply. It is therefore important that he should know something about the "Oestrus" in cows or "the period of heat." This is the time when the cow calls for the bull.

A heifer will come on 'heat' for the first time any time from the age of two to four years according to the state of her maturity, condition, environment and feeding, *i.e.*, an early matured heifer reared under good conditions will take the bull much earlier than one which is underfed and undersized. In temperate climates, cows come on heat about three weeks after calving and every three weeks after that until they conceive; but in India, the indigenous cows vary from three weeks to a year or more after calving and their periods are very irregular. On the average the Indian cow in good condition will conceive about three to four months after calving. Some people are under the impression that a cow will conceive at any time if covered by the bull. This is not so; a cow must be properly "on heat" if she is to conceive. It is not so; waste of time taking her to the bull unless she shows the signs of "Oestrus."

It is very easy to see how a heat period in a cow might easily be missed. There are often no apparent preliminary symptoms of approaching heat such as are observable in the bitch, which bleeds extensively for several days (pre-oestrus). External haemorrhage in the cow or heifer, if it occurs at all, does so two or three days after the beginning of the heat. This is far more common in heifers than cows; in the latter it is rare, but in heifers the appearance of blood-stained mucus at the vulva is quite frequent; it forms a useful indication as to when the animal may be again on heat. On the average, heat lasts about 16 hours in heifers and 19 hours in cows. In the cold season a heat period may only last six hours as against sixteen or more hours in hot season. It is easy to see, therefore, that a period occurring in the night is overlooked. Again it is more difficult to detect the heat when the cow is tied in the stall than when she is allowed to run about.

In some cases ryots will not allow their cows to be taken to the bull whilst they are in milk and suckling their calves in the belief that if the cow is served by the bull, the cow will immediately go dry. This is not so; the cow will continue to yield milk if properly fed.

The following signs of "Oestrus" in cows will benefit cow owners in discovering the proper time to send their cows to the bull.

(i) The cow will be restless and will switch its tail frequently from side to side and will turn her head towards its hind quarters. (ii) It will go off its feed for a day or so. (iii) The external genital organ (vulva) will be slightly swollen and there will be a slight discharge of a white slimy mucus. (iv) It will stand with its tail raised and ears erect and will stare at individuals. (v) Frequent passing of urine. (vi) Milk yield will decrease for 2 or 3 days and does not allow calf to suckle properly. (vii) If tied in a stall, will be restless and will bellow frequently. (viii) If allowed to graze or exercise with other cows, she will be seen to jump on them or allow others to hump her.

All cows should be taken to the bull immediately these signs appear. It is no use waiting until the next day as this may be too late.

The above symptoms become more pronounced in an adult cow than in a heifer or first calving cow.

Breeding Bulls and their Management

There are occasional complaints that some breeding bulls are slow servers and others refuse to serve at all. It is therefore necessary that the agriculturists should be informed of some of the reasons why this happens.

Slowness of service is not necessarily an indication of infertility. It is true, however, that they are often associated and notably so in animals which are too fat or alternatively, in those which are going back in condition. The best condition for breeding in males is a hard one produced by sufficient exercise to work off surplus of fat but favouring the retention of nitrogenous substances and vitamins. However it

cannot be sufficiently stressed that with the male, as well as with the female, a rising condition is always more conducive to the proper discharge of the productive functions than a falling one. A breeding bull can be worked for half a day in a single bullock cart or can be used as a work animal in agricultural operations. The bull should be well fed and given green fodder whenever available, its muscles should be fairly hard and there should be very little fat on its body; but do not allow it to lose condition and become too lean. Groom it daily and pick of all ticks as these reduce its vitality and irritate it.

Slowness in service is some times physical in nature due to strange surroundings or the nature of the control to which the animal is subjected. Hesitation in service is also sometimes the result of sores or warts, and males are in best condition for service a few hours after they have been fed when they are more active than directly after a meal. It is sometimes noticed that stud animals which have travelled long distances and are introduced into fresh surroundings are temporarily infertile, especially when the new conditions are less favourable than those to which the animals have been accustomed. This however, is usually only a temporary result and full fertility can generally be restored by favourable treatment in the way of diet and surroundings. When a new bull is purchased and brought to the homestead, feed it on the same ration, if possible, as it was formerly fed on, allow it time to become accustomed to its new surroundings and do not illtreat it. House it in a comfortable shed, give plenty of exercise as stated above and allow it to rest for two or three weeks before it begins its service.

It is of great importance that a male animal should be used regularly. It should not be used too much at one time and too little at another. It should be remembered also that prolonged periods of disuse may be as injurious to the bull as over-use, since undue accumulation of semen in the generative passage may result in back pressure and deleteriously affect the spermatogenic capacity of the testes and possibly also interfere with the functional activity of the accessory sexual glands. In India a large number of cows come on heat after the rains and when good grazing is available and breeders are apt to permit the bull to perform too many services in a short period. This is undesirable; the number of services in a month should be limited to ten or twelve at the most in these heavy seasons. If possible the services should be spread out evenly throughout the year.

With any young males it is inadvisable to allow service to occur too often, even though the service may be fertile, as frequent service when performed too early, is likely to result in undergrowth of the sire and to impair its breeding capacity in later life. Young males are most liable to suffer from underfeeding and over use, whereas old males suffer from overfeeding and under-use. Many young early matured bulls are ready for work at 2½ years old but as the bull is not fully grown until about 4 years old, its services from 2½ to 3 years should be limited to three per month, from 3 to 4 years to four per month or fifty in the year. If a young bull allowed to serve a great number of cows in its early life, the length of its breeding life will be considerably reduced. See that a young bull is well-fed and kept growing. In the case of matured bulls, the rations can be decreased if it is seen that they are becoming fat.

In general, the males of the lighter breeds are able to serve more females successfully than those of the heavier breeds. Kangayam and Hallikar bulls are much quicker at service than the bulls of the heavier breeds such as the Ongoles and Sinds.

Onanism or sexual abuse is sometimes a source of trouble, more especially in young animals that are given little service. This is often seen in India and to avoid it as far as possible, give the bull some hard work to do if there are no services to perform.

A bull will refuse to serve a cow which is not properly in heat and will not stand. This is a very common complaint unnecessarily made against the bull. It must be remembered that the period of heat (Oestrus) in cows only lasts for about sixteen hours and it is essential that the cow should be taken to the bull at once before the heat subsides; otherwise the cow will not stand and the bull will not serve it.

Early Mating of Animals

EXPERIMENTS AT RESEARCH INSTITUTE

HINDU 29—1—37

Supporters of the Sarda Act will be shocked to learn that early mating in animals has resulted in improvement of stock. Experiments have been proceeding at the Imperial Agricultural Research Institute, New Delhi, for the last three years under Mr. Wynne Sayer, Animal Husbandry Expert, to find out whether, by improving the feeding of calves from birth in accordance with the English standard of cattle rearing, it was possible to bring these calves to a suitable size and development for breeding at an earlier age, i.e., to start bulls serving at 18 months instead of three years and heifers and calves at 18 months instead of two years and six months.

These experiments over a period of three years show very clearly that no deterioration nor weakening of the herd had occurred. On the other hand the period of milching in cows had increased by about a year. Animals born as a result of this experiment were shown to-day to the members of the Advisory Board of the Imperial Council of Agricultural Research who are now in Delhi. They appeared to be perfect in every way, but some veterinary experts, told a representative of the Associated Press that it was too early to form any conclusion.

Members of the Board were then served with tea. Among those present was Sir Frank Noyce, who later planted in the courtyard an *alstonia scholaris* tree, in memory of his visit.

Livestock Improvement

Sir,—It is really praiseworthy that the sub-committee of the Provincial Economic Council, Madras, should have dealt with the subject of

livestock improvement in a thorough manner. There is only one point which does not fit in with other practical and urgent propositions of the Committee. The proposal "to entrust the work of castration, inoculation and treatment of minor ailments to a much cheaper agency than veterinary assistant surgeons" would do more harm than good. The difficulties in the field are such that even for duly qualified veterinary assistant surgeons, it is some times a tough proposition to diagnose correctly the exact disease prevailing in a village. Very frequently cross infections make the matter worse. The district veterinary officers are wired for and they run up with their microscopes and after careful examination the needful is done. All this has inspired confidence in the minds of the ryots and the present popularity of the Veterinary Department is not a little due to the exceedingly thorough and scientific manner in which it carries out its work. Nothing should be done to damage its growing popularity. One can well imagine the disastrous results of affording protection against hæmorrhagic septicæmia when actually the disease prevailing is anthrax! The remedy lies in giving immediate effect to the other proposals of the Committee for the expansion of the Department and not in creating a cheaper agency.

As for the control of the livestock section, instead of creating a new agency with sufficient number of hands and supervising staff involving great expenditure to the Government the present existing rural staff of the Veterinary Department with a little more addition will make an admirable agency "to deliver the goods". The ryot has now learnt to look up to veterinarians for every thing connected with cattle. Others have to prove their credentials to the satisfaction of the conservative ryot,—which is not an easy matter—that they are equally capable of handling livestock problems. The policy of least resistance is just as good in this as in other matters in a country like India. Public opinion is in favour of transfer of the livestock section to the Veterinary Department. The matter has been delayed too long and let us hope the Government will do the needful at an early date.

A District Economic Council Member.

HINDU 26-11-36.

Farewell Address

TO

Dr. Y. N. MARATHE, G. B. V. C.

Cow is the Mother of Prosperity

DEAR HUMANITARIAN FRIEND,

On behalf of the undermentioned Associations of Bombay, interested in the welfare of Cows and other dumb animals, we offer you their hearty congratulations on your appointment as *Livestock Expert and Director of Veterinary Services*, Baroda State, on the eve of your retirement from the responsible post of Deputy Director of Veterinary Services to the Government of Bombay Presidency.

On this occasion while recapitulating your eminent and sympathetic services to the cause of cattle we cannot refrain from observing that your sympathetic efforts for rendering efficient Veterinary aid to the suffering cattle, were responsible for relieving the sufferings and saving thousands of cattle from premature deaths. This, along with your zealous efforts to save cattle during the times of *epidemics*, which are unfortunately so frequent, will be gratefully remembered by the public and prove guiding to your successors and colleagues in the Department.

What adds to your popularity and our regard for you is the fact that during your long period of services in the Department, you never missed an opportunity of securing efficiency and expansion of your noble work, with the co-operation of *societies* and *individuals* interested in the cause of cattle. As some of those, whose co-operation you secured, we would have missed you very much, had it not been for the fact that you are appointed as the Head of the Livestock and Veterinary Department in the *enlightened and pioneer Hindu State of Baroda* wherefrom you will have ample opportunities to serve the dumb animals and to give us the benefit of your advice and experience.

While holding a responsible post in the Civil Veterinary Department, your deep concern for the protection and improvement of cattle in this Presidency, prompted you to render many useful services for the improvement of cattle, even prior to the establishment of the present Live Stock Department. It should be a matter of satisfaction and honor to you that the need for organised work of improvement of Livestock, pointed out so often to the Government by you, was subsequently recognised by Government and has now attracted great attention of the people and the Government.

Your deep concern for the Cause of Improvement of Cattle and Prevention of Cruelty to Animals is further evidenced by your noble efforts through Poona Cattle Improvement Association, which owes its inauguration mainly to your efforts, and latterly as Secretary, Society for the Prevention of Cruelty to Animals Poona, and as a Trustee, Poona Panjrapole.

We cannot help mentioning with deep regard, your valuable services in saving the dumb cattle from mal-treatment by the cultivators and the indifference of Pinjrapoles and Goshalas which you visited frequently. Many Pinjrapoles and Goshalas, including the Bhivandi Branch of Bombay Pinjrapole, which acted upon your suggestions, could improve their working.

On this occasion we beg to convey to His Highness the Maharaja Gaekwar of Baroda, our sense of gratefulness and appreciation for your selection and assure His Highness that the *selection has fallen on worthy shoulders*.

Finally, on behalf of the dumb cattle of the Presidency, we convey to you our deep sense of gratitude for the noble services rendered by you to the cause and expect greater achievements at your hands hereafter, especially with regard to the exploitation of milch cattle from

Baroda State and their subsequent destruction, when running dry in cities like Bombay—a matter which has even bestirred *His Excellency Lord Linlithgow*, the sympathetic Viceroy of India.

Wishing you a prosperous long life,

We remain,

Yours in the Cause of the Dumb,

Presidents and Members of :—

B. P. Cattle Imp. Association,
Gogras Gojivdan Mandal.
Bombay Humanitarian League.
Bombay Gogras Bhiksha.

Padamshi Damodar Govindji, J. P.

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President of the Meeting.

Reviews

Malkmus' Clinical Diagnosis of the Intestinal Diseases of Domestic Animals:— 11th Edition. Revised by **John R. Mohler**, M. A., V. M. D., D.Sc., and **A. Eichhorn**, D. V. S. 312 pages. 72 Illustrations. **Publishers :—** Bailliere, Tindal and Cox, London. Price 15s.

The great paucity of literature on the diagnosis of diseases in Veterinary Medicine will make the practitioners as well as the advanced students of Veterinary Science jump with joy at the publication of a new edition of this book on the subject. Neither of them will be satisfied with the information available in this book. In the latest book on any science the expectant readers will like to have the most up-to-date methods and achievements of the scientists all over the world. These are prominently absent in this book.

The subject of X-ray with its use on the diagnosis of a variety of disease condition has not been touched upon.

A fair amount of information is available on 'The Blood,' but very meagre treatment is bestowed on diseases of the blood and their diagnosis. The latest nomenclature in the Piroplasmosis of animals could have been used and the differences between the various species could well have been mentioned from a diagnostic point of view. Similar is the case with Trypanosomiasis. *T. theileri* has been mentioned to be one affecting cattle, but it is not pathogenic to them ordinarily. No mention is made of wire worms and very little of Coccidiosis being the cause of diarrhoea and dysentery in young cattle.

Sterility and its causes are attracting the attention of veterinarians all over the world and no attempts have been made to render justice to this subject in this book. The subject of pregnancy in domestic animals and the latest methods of diagnosis of the condition should find a place in a work of this kind.

Vomiting in dogs occurs both in disease as well as in health. The authors do not recognise this condition in dogs when they vomit immediately after taking a dose of nauseating dose of medicine or when they occasionally eat blades of grass and vomit.

The authors do not do justice to the deficiency diseases and how to diagnose conditions caused by deficiency of mineral constituents of blood as vitamin contents of food.

Neoplasms do not find a place in this book except those formed in the head. Carcinoma of the uterus in large animals and the venereal granulation growths affecting the genital organs of the dog could have been mentioned. The means of differentiating the discharge emanating from a case of metritis from that due to a case of cancer will be a useful addition.

As regards detection of Tuberculosis with Tuberculin, the authors make a statement that cutaneous tuberculin test is not as reliable as either the subcutaneous or ophthalmic test. But the latest and most reliable test for this disease appears to be the one known as the 'Double Interdermal test'.

The differential diagnosis in diseases presenting very similar clinical symptoms is a factor that should find a place in every book on Diagnostics. This is very prominently absent in this book.

The get up of the book on the whole is quite good so also the illustration. The above points of criticisms are meant to be of a constructive nature, so that they may be thought of when the next edition is to be printed.

Better Dairy Herds through Breeding:—(Published by Hoard's Dairyman Journal of America, and available from D. K. Parvate and Brothers, 627, Sadashiv Peth, Poona City. Price Re. 1 & 4 as. including postage.) This book presents to the reader a rather difficult problem in the better breeding of Dairy cattle,—a problem without the solution of which all progress in this line must come to a standstill. "How to select a bull" is not a matter easy enough as it appears on the face of it. Mendelian theory of heredity has much more to say in this respect than the majority of Dairymen in the world today have understood. This book with sufficient illustrations brings to light the important fact that "Like does not beget like" if appearances only are trusted, and if the old and easy methods of breeding are followed. It prebonds the tremendous influence which is attached to Dairy records, and gives a definite idea as to how these records should be interpreted,—certainly a new shrew and subtle policy, and yet strangely enough arithmetical. The progress which the Danish Dairy Industry has made along these lines

is recorded in one of the chapters, and throughout the book an emphatic tone of expression is maintained, which is the outcome of a thirty years' deep study on the Hoard's Dairyman Cattle Breeding farm. The book has not failed to cause a stir among American Breeding circles, to whom it comes as a new revelation of the old Mendeline principles. Since, these principles of heredity are the same everywhere, and are not known to differ by climatic or other geographical conditions, whether Indian or American, we sincerely recommend this good book to our readers.

The Feed Book:—(Published by Hoard's Dairyman Journal of America, and available from D. K. Parvate and Bros., 627, Sadashiv Peth, Poona City. Price Re. 1 and 4 ans. including postage) "An excellent book" that is in short our opinion about this another Hoard's Dairyman publication. It would give certainly a profitable reading to a practical Dairyman who would like to know all about his particular vocation. The book details on the feeding practices especially with relation to a cow in calf, a Cow in milk, a Bull of Breeding, a Calf of 1-2 year old and so on. It does not even look over the horsekeeper, a shepherd, a swine-breeder or a poultry-feeder, all of whom will find a ready answer to their own peculiar feeding problems. The book lists a variety of 52 different feeds, giving their thorough analysis, coefficients of digestibility, and different feed combinations with proper calculations. Numerous interesting tips are also offered to practical Dairy farmers, who, we are sure, will appreciate them. One thing however should be remembered about this book, that nearly a half of the feeds in this book are not produced on the Indian soil, and the eating and digesting capacity of Indian and Foreign cattle differs considerably; hence a bulk of the information contained in this book will have to be utilized with a considerable modification. But it would be unjust to attribute the fault to the book itself.

Obituary.

We regret we have to announce the untimely demise of Mr. **V. P. Subbaya**, Veterinary Asst. Surgeon in the Madras Civil Veterinary Department, at Saidapet on 21st June 1937. He was aged 45 years. He was ailing from Kidney disease for the past one year and even in spite of best medical aid, he succumbed to the disease. Our heartfelt condolences go to his bereaved family.

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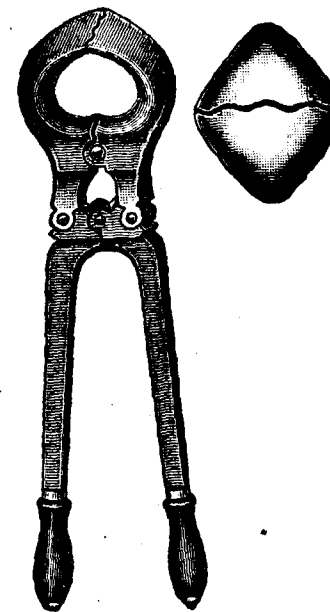
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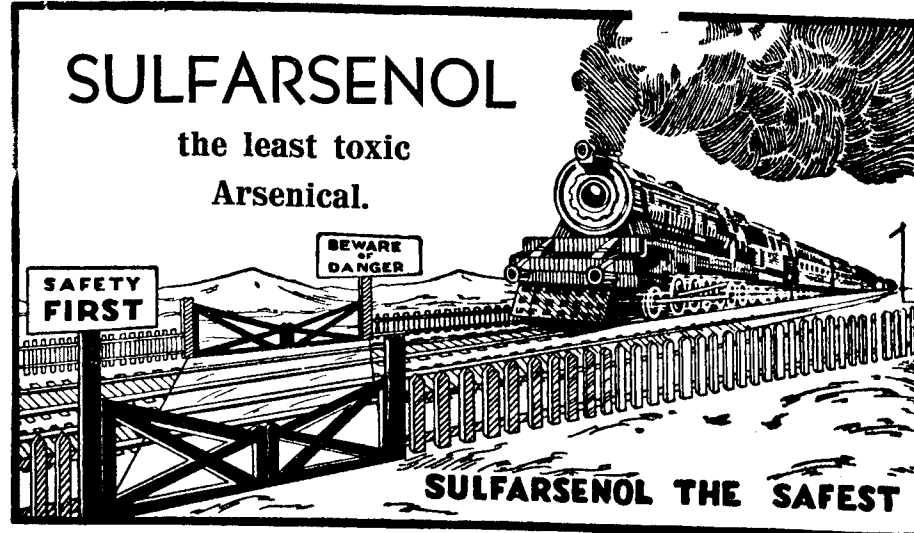
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