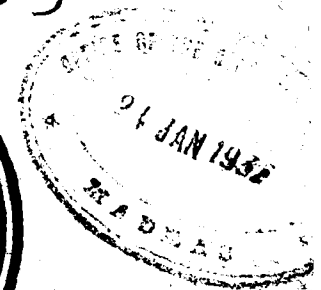


THE
INDIAN
VETERINARY
JOURNAL



Vol. XI.	EDITOR: P. SRINIVASA RAO, G.M.V.C., Veterinary Surgeon, MADRAS.	No. 2. Oct. 1934.
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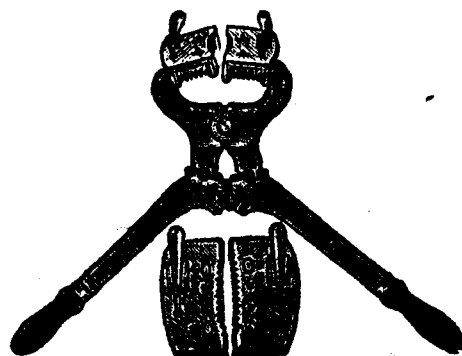
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Vol. XI.

October, 1934

No. 2.

The Indian Veterinary Journal.

(The Journal of The All-India Veterinary Association)



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P. SRINIVASA RAO, G.M.V.C.,

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1934

NOTICE

The Indian Veterinary Journal

A quarterly record of Veterinary Medicine and Surgery
devoted to the cause of the Veterinary Profession.

PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION.

EDITOR :

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(The Journal of the All-India Veterinary Association)

Vol. XI.]

OCTOBER, 1934.

[No. 2

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THE Indian Veterinary Journal

Vol. XI]

OCTOBER, 1934.

[No. 2

Editorials.

ANIMAL TUBERCULOSIS AND JOHNE'S DISEASE.

In drawing the attention of our readers to a thought provoking article published in this issue from the pen of Capt. S. C. A. Datta, B. Sc., M.R.C.V.S., on the incidence of Animal Tuberculosis and Johne's disease, we earnestly hope that the potentiality of the serious menace of these scourges to the dairying industry, and particularly to the costlier and better class of cattle in India, will be appreciated by the powers-that-be in this country. Mainly due to great economic distress and the resultant extensive unemployment amongst the educated classes, there is of late a healthy tendency towards a more profitable exploration of the hitherto untapped resources in the country and a greater realisation of the great economic possibilities of the live-stock industries in particular. Intensive methods of dairying are now being increasingly adopted in a good number of stations and attempts for the supply of cheaper and larger quantities of more wholesome human food through animal industry are being exhibited all over the country. Time has, therefore, arrived for an organised relentless onslaught on these two diseases in every Indian Province and State.

Until comparatively recently, Veterinary workers in India were preoccupied with the ravages of epizootics of Rinderpest, Hae. morrhagic Septicaemia, Black-Quarter and Anthrax amongst cattle. Consequently, the equally important constructive aspects of Animal Nutrition, Animal Husbandry and Poultry Rearing had been sadly neglected, the evil results of which have been almost irreparable. Even in the sphere of animal pathology, no serious attention to the elucidation of chronic and insidious diseases had been paid. Diseases

which had received the attention of English Veterinary Surgeons in India commencing with Moorecroft, as early as the beginning of the 19th century, have only recently been elucidated. Even diseases of parasitic and nutritional origin, have for a long time remained uninvestigated. Latterly, however, notable advances have been made in the etiology of diseases like Bovine Nasal Granuloma, Kumri, Osteoporosis, Blindness in Calves, Bursatti and Equine Debility of Schistosome origin, and we are glad to note that the complete life-history of the causal helminth has been definitely established as in the case of the first-named disease by Mr. Anant Narayan Rao in Madras.

Again, as far as Tuberculosis and Johne's disease are concerned, the almost pioneering work of that great medical missionary Arthur Lankaster published in 1920, appeared to show that Bovine Tuberculosis was practically unknown in India, contrary to its distressing large portion in Europe. This finding, however, turned out to be only illusory; for the experiences of Veterinary officers, Principals of Veterinary Colleges, Medical officers and the Heads of Dairy Establishments in India have conclusively shown that the diseases are not quite so rare as was once supposed. The recent figures of such an eminent authority as Soparkar and his associate Dhilon, show that the percentages of incidence of tuberculosis in bullocks, buffaloes and cows at the Lahore Slaughter House were as high as 31, 23 and 21 respectively. Krishnamurti's work in connection with the conservancy bullocks of the Madras Corporation is no less significant. Several cases of advanced tuberculous mastitis of the cow, and at least a genuine case of tuberculosis of bovine origin in a girl at Bombay, are on record. It is therefore apparent that the old views were born of imperfect investigation and that tuberculosis in cattle in India is a widely prevailing disease in this country. It is also equally apparent that it can be as severe as in the west. No species of animals seem to be exempt. There is evidence that the disease is no longer restricted to crowded localities but that it has entered into the villages in the country-side as well.

With these facts and findings before us, it seems to us to be an altogether unjustified contention, as they did in the past, that the measures for guaranteeing *clean* milk in this country need only be directed towards the prevention of contamination after milking, and not against the elimination of the organisms by the cow. For, it is an established fact that the normal udder of lactating cows and goats will permit the passage of *B. tuberculosis*, and that the absence of actual udder disease is no safeguard against the dangers of the disease being contracted. Medical authorities in India and outside explain the infrequency of the surgical forms of tuberculosis in

Indian children on the basis of their unsupported contention regarding the comparative absence of the bovine disease in this country. For the reasons already noticed above, these views require radical modification, and the sooner a close co-operation is established in this matter between Medical Practitioners and Veterinary Surgeons together, the better for the country.

It is gratifying to note that a comprehensive proposal for a Specialist officer for Tuberculosis and Johne's disease was put up in an irresistible form by Mr. Ware in the cold weather of 1929. This proposal has been approved of by the Governing Body of the Imperial Council of Agricultural Research on the recommendation of the Advisory Board. The discussions in the Imperial Council of Agricultural Research show that a general agreement existed in the Council that both the diseases were spreading and that an investigation into these diseases and the working out of successful methods of protection against them were of great importance to the Indian agriculturists. It is now some years since the proposal was sanctioned, and although a large number of highly qualified Indian Veterinarians are available, it is to be regretted very much that it has not yet materialised. In the meantime, the resourceful and enthusiastic Mysore State has stolen a march in the investigation into certain field-aspects of Johne's disease with the help of a grant from the Imperial Council of Agricultural Research. We do hope that, hereafter at least, there would not be much time lost in the appointing of the Special officer to go into the problem of the two acid-fast diseases in India.

THREE NOTABLE RETIREMENTS.

We have great pleasure to record in this issue the retirement of three distinguished colleagues, each having given his best to the Crown and Country for well over three decades.

Khan Bahadur Sheikh Niaz Mohammad retired as the Director of Veterinary Services, United Provinces, in July last. Of him we have had enough of occasions to write in these pages and our readers are well aware of the many sided activities of this esteemed colleague. From the lowest rung of the official ladder he rose to the highest pinnacle open to a Veterinarian in this country and it must be said to his credit that whichever position he held, he filled it with distinction. We look forward to him to resuscitate (for that will be the correct term) the All-India Veterinary Association, which he with a few other colleagues was responsible to bring into existence at Moradabad in 1922.

Khan Bahadur Jehangir Dhanjibhai Buxy who retired as Deputy Director of Veterinary Services, Bombay, on 9-1-1934 is yet another gentleman of great distinction. Entering service on 3-9-1901, in the Subordinate Service of the Civil Veterinary Department, Bombay, it took him barely 12 years to establish his claims for a post in the Gazetted rank. From his place as Deputy Superintendent of the Civil Veterinary Department, Bombay, he has acted as many as seven times either as Superintendent, Civil Veterinary Department, Bombay or as Superintendent Civil Veterinary Department, Sind and Rajputana. He was raised as Deputy Director on 1-4-1932, which position he held to the last day of his retirement.

Rao Sahib Joachim D'Costa, Deputy Director of the Imperial Veterinary Serum Institute, Izatnagar, has also retired from Government Service from 15-2-34. He is a gentleman of unostentatious manners, who dreads the lime light. Graduating from the Bombay Veterinary College in 1899, he took up a temporary appointment as Veterinary Surgeon in the State Stables in the Janjira State and Veterinary Surgeon in charge of State Veterinary Hospital and stables in Khairpur State, Sind, from 1901 to 1908 and later was appointed as Veterinary Inspector at the Imperial Institute of Veterinary Research, Muktesar, U. P., then known as Imperial Bacteriological Laboratory. After being appointed as Deputy Superintendent in 1915, he was responsible for the administration of the Veterinary section, manufacture of different sera and for training, in Serum Therapy and Serum simultaneous inoculation, of the officers who attended the short and long courses at the Institute. In 1930, he was transferred to the branch institute, Izatnagar, Bareilly, as temporary Director from where he took leave on 15-2-1934 preparatory to retirement. He has been a sound and silent worker and not a little of the success of the sub-station at Izatnagar, was due to him. We should like to pull him out soon and publish in these pages, his profound knowledge of preparation of various sera and vaccines.

All these gentlemen have laid down office, full of years and full of honours and besides looking forward to their active co-operation to advance the interests of the profession in India, we wish them individually a long and peaceful retired life, full of happiness and health.

General Articles

THE POSITION OF TUBERCULOSIS AND JOHNE'S DISEASE IN INDIA WITH SUGGESTIONS FOR THE BEST METHODS TO ADOPT FOR THEIR DIAGNOSIS AND CONTROL.*

BY

CAPT. S. C. A. DATTA, B. Sc., M.R.C.V.S.,

*Veterinary Research Officer in Charge of Pathology (Temporary)
Imperial Institute of Veterinary Research, Muktesar.*

It is a truism to say that Tuberculosis and Johne's disease have been the nightmare of Dairy Farmers all over the world and have engaged no little attention from scientists in most countries for decades. The position in India, on the other hand, has been most unsatisfactory, for until quite recently workers here were so obsessed with the ravages of diseases like rinderpest and haemorrhagic septicaemia that no serious attention has been paid to the diseases of cattle of a chronic and insidious nature. Consequently, the literature comprises only a few stray case reports and some slaughter house statistics of these conditions.

TUBERCULOSIS.

Our conception of the various aspects of the problem of Tuberculosis in this country has undergone considerable modification in recent times, due in particular to the Bovine Tuberculosis Enquiry (1923-1928) carried out at Muktesar under a grant from the Indian Research Fund Association. In an attempt to discover why bovine tuberculosis was so rare in this country, as was then the general belief, Liston and Soparkar (1917) raised certain important questions for investigation, which were followed by Sheather (1920), leading finally to the comprehensive enquiry under Soparkar at Muktesar, the terms of which were :—

- (a) Susceptibility of bovine animals in India to tuberculosis.
- (b) The virulence of strains of tubercle bacilli isolated from natural bovine lesions in India.
- (c) Diagnosis of latent tuberculosis by the application of the tuberculin test.
- (d) Examination of the types of tubercle bacilli responsible for tuberculosis in man and animals in India.

* Read before the Meeting of the Animal Husbandry Wing of the Board of Agriculture, held at Delhi, February 1933.

Although the enquiry covered a lot of ground, and added a wealth of valuable information, it must be realised that very important questions still remain to be solved. It appears from authentic figures of the incidence of tuberculous lesions in cattle slaughtered at several Municipal Slaughter Houses that an appallingly rapid spread of the disease has taken place during an interval of about 15 years only. For instance, the percentage incidence estimated by Taylor and Oliver in 1917, was about 3% only, the incidence in 1927 estimated by Soparkar was 16.28%, but the latest figures, worked out by Soparkar and Dhilon (1931) show that out of 1,116 animals examined at Lahore, 21.3% cows, 23.6% buffaloes and 31.6% bullocks showed tuberculous lesions. Added to this, is the disquieting information that the disease is no longer restricted to North India and it seems to be spreading amongst all species of domestic animals. Evidence has been collected at this Institute from a certain Military Dairy Farm and two Remount Depots to show that after introduction of infection, a high incidence of clinical tuberculosis may develop in a herd, maintained under conditions of domestication simulating those of the west. With regard to the susceptibility of buffaloes, Soparkar's earlier (1924) experiments indicated "the buffalo to be much more resistant than the calves" but his later experiments (1926) point to the buffalo being more susceptible to tuberculous infection than the cow. There is evidence of the occurrence of tuberculosis in 4% pigs slaughtered at Bandra in Bombay and it is known that in 1924, a small but severe outbreak of the bovine type of tuberculosis occurred in the Victoria Gardens, Bombay, amongst llamas, obtained from Germany, and that the disease spread to several spotted deer and a blue bull. Of the other species of animals, definite evidence about the occurrence of natural cases of tuberculosis amongst goats, horses, elephants, fowls, dogs and camels is available at Muktesar.

The available results of bacteriological work carried out upon lesions of tuberculosis in animals in India show that the bovine type of organism is commonly associated with bovine lesions and the human type with the disease in pigs. The avian type of organism has also been recovered from a bullock and some pigs, and the bovine type from a pig, a goat, several llamas and buffaloes. The human type of tubercle bacilli is believed to be usually responsible for the disease in man in this country, but the current view amongst medical men that the surgical forms of human tuberculosis in India are entirely independent of infection from the bovine species would seem to require some modification, since Soparkar (1929) has succeeded in proving the disease in a girl in Bombay to be definitely due to the bovine type of the bacilli, and because the occurrence of two severe

cases of tuberculous mastitis of the cow in Bombay and the Punjab are on record.

The pathology of tuberculosis amongst animals in India is little known. The exact mode of infection, the comparative incidence of paranchymatous or lymphatic, of intestinal or respiratory lesions and how the receptivity of cattle varies at different periods of life require to be studied. With the exception of a few cases of generalised lesions, it has been observed by more than one worker that the bovine lesions in this country are usually minute in extent, localised in the tissues in which they are commonly found. A question of some interest has been raised by Lankester (1923) who remarks: "I am not aware of any authoritative investigation of having been made which can be said to definitely negative the suspicion that some at least of the cases of tuberculosis in bovines in India may in reality be the result of direct infection from man."

Diagnosis may be arrived at during the life of an animal from clinical signs of the disease or by the tuberculin test or from both. The tuberculin test is intended to pick out animals before they have a chance of becoming dangerous to the herd and in advanced cases no reaction may be obtained. Since there are considerable diurnal fluctuations of temperature in India, the Double Intradermal Test, as recommended by the Medical Research Council, has been adopted in preference to the subcutaneous test and it is usually recommended that the Double Intradermal Test be carried out with both ordinary and avian tuberculin since, with so little extra trouble valuable information in regard to the elimination of Johne's disease may be obtained.

It is important to recognise the possibility of atypical forms or "no-lesion" tuberculosis, in which a thorough *post mortem* examination fails to reveal microscopic lesions. A finding of considerable significance, therefore, has been recorded by Soparkar (1927), in which, he has been able to isolate fully virulent tubercle bacilli from material of an apparent reactor to the subcutaneous tuberculin test, though no naked eye lesions were detected on slaughter, and similar cases have been encountered recently at this Institute.

The control of tuberculosis is a thorny question and the policy to be adopted towards reactors to the tuberculin test bristles with difficulty in India. Experience has shown that it is not a problem that can be left to the individual cattle owner; it is a problem involving much larger interests. A general tuberculin testing of all cattle in selected areas and farms at regular intervals, followed by elimination of all reactors, and destruction of every animal showing signs of clinical tuberculosis is the procedure in England. A reactor

to the tuberculin test is not necessarily condemned to death there, for the animal may not be infected with 'open' tuberculosis, but it precludes an owner from holding a "certified" or Grade A (T. T.) milk license. Bang's method of isolating reactors and building up and maintaining herds free from tuberculosis has been tried with great success in certain countries, notably in Denmark. In certain cattle establishments in India the English procedure has already been adopted, but it would appear that Bang's method with certain modifications, would be more suitable for this country, in which there exist a conservative feeling against the slaughter of cattle.

In view of the alleged rarity of bovine tuberculosis and its surgical manifestations in man in this country, it has been contended in the past that measures for the improvement of the milk supply need only be directed towards the prevention of contamination after milking, rather than against the elimination of any specific organisms by the cow. It must be remembered in this connection that actual disease of the udder is not necessary for the elimination of the organisms in the milk, since Stanley Griffith (1927) has proved that the normal udder of lactating cows and goats will permit the passage of tubercle bacilli, whether of the bovine or human strain.

With regard to preventive vaccination, experiments have been carried out for 50 years or more, in the hope of finding a satisfactory method of immunising against tuberculosis by the use of either living virulent organisms, dead organisms, or living avirulent strains. The second has never been successful; in the first the potential danger is too great, but the third is still raising great hopes. Even admitting that calves vaccinated with B. C. G. are more resistant than non-vaccinated, as Buxton and his co-workers (1932) have shown, one must go very cautiously since information regarding the fate of the injected bacilli and regarding the possibility of the original virulence being regained in the same or another animal is still lacking. Spahlinger's vaccine has given encouraging results in the first trial carried out with it on animals, but little is known about it yet.

JOHNE'S DISEASE.

Johne's disease was first diagnosed in this country as late as 1917, but, from a remarkably large number of records now available, it is apparent that this disease is very widespread in cattle throughout India. Compared with cases in Europe a larger proportion of cases in this country show a complete absence of clinical symptoms, but the examination of bowel washings, rectal smears or biological tests betray the actual state of affairs. This very insidious onset makes the presence of Johne's disease in a herd a most dangerous one, particularly in farms which are heavily stocked.

Fairly satisfactory methods for the diagnosis of Johne's disease are available in the shape of certain biological reagents and in the bowel washing method, as employed by Prof. Krishnamurti, and the rectal smear method. Brews of Vallee and Rinjard's *paratuberculin*, Dunkin's Johnin, as supplied by the respective workers, and also a brew of Johnin, prepared from Indian strains of Johne's bacilli have all been put to comparative tests at this Institute and the indications at present are that none of the other agents is equal in value to the avian tuberculin at present issued from Muktesar. As a result of systematic tests carried out all over India with the last mentioned preparation, accurate information on the incidence of Johne's disease is now available, but there is still considerable room for improvement in this matter of a diagnosis agent for Johne's disease. Certain anomalies are from time to time encountered, in particular, the failure to evoke a reaction in certain stages of the disease. As already suggested, a double test, employing both avian and human tuberculin, is advisable, since the possibility of double infections of Johne's disease and tuberculosis in the same animal has to be eliminated.

Both cattle and buffaloes in India are known to be affected with Johne's disease, but the presence of the infection in sheep, goats and deer is also not unlikely. The influence of parturition in precipitating a crisis in cases of Johne's disease has been repeatedly seen and it is possible that other factors may play a part in the sudden break down of an animal's natural protective mechanism. Mineral deficiency has been suggested and it has been observed in England that there is some immunity from losses from this disease on farms with a sandy soil, but that mortality from this cause is very severe upon granite soils. From the experience of certain unprogressive clinical cases at Muktesar, it is conjectured that environment and soil variations may play a part in the incidence and progress of this condition in India.

The question of control measures is very much in the experimental stage and it is doubtful if any medicinal treatment or prophylactic or curative vaccine can be considered satisfactory. Extensive trials have been given to several drugs, in particular a preparation of Iron Sulphate orally, and formalin intravenously, but with little success. Non-specific protein therapy with egg-albumin has been tried at Muktesar, and on destroying some of the treated cases, which were previously diagnosed as suffering from Johne's disease, no signs of the disease were detected at *post mortem*, but environment may have played a part in the retrogression of these cases. What is required is a drug which will act directly on the causal organism, on the analogy of the specific action of chaulmoogra oil on the Leprosy bacillus, another acid-fast organism.

Vaccination.—Certain phenomena connected with the acid-fast group indicate more than a mere accidental affinity between the organism of fowl tuberculosis and the Johne bacillus and it was on the basis of this affinity that the Johne organism was first successfully cultivated, the diagnostic agents, avian tuberculin and Johnin were evolved and finally Vallee and Rinjard prepared their prophylactic vaccine, which raised great hopes all over the world. The possibility of a cross-immunity, such as is aimed at in a method of vaccination, being set up in nature has been suspected in India by Soparkar (1927) who observes:—“One batch of these animals (cattle with admixture of European blood) was obtained from a place where Johne's disease was very prevalent. Whether this circumstance had any connection with the very high resistance (to tuberculosis) displayed by the animals, it is difficult to say.” A successful vaccine, if one such were available, would obviously be a great boon to cattle owners in India, and for several years past, therefore, large scale experiments have been undertaken at Muktesar on more than one occasion to study the vaccinating relationship between the bacilli of Johne's disease, and those of avian tuberculosis, but the results obtained have, so far, been inconclusive.

A SUCCESSFUL METHOD OF TREATING PROLAPSE OF THE VAGINA AND UTERUS IN ANIMALS.

By

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Prolapse of the vagina or uterus is the term applied to the condition when one or both of these organs are turned inside out. The former condition may take place during advanced pregnancy, but the latter may occur immediately or shortly after normal or premature birth. All animals are liable to suffer from this accident, but it is most frequently met with in cows and buffaloes.

Various methods have been introduced to return the prolapsed organs to their positions and to prevent re-occurrence. Great success has been achieved so far in returning the inverted parts, but in retaining and preventing re-occurrence Veterinarians have not always obtained successful results. Different methods have been adopted by various surgeons such as the use of pessaries, West's Clamp, a bottle, the application of trusses or suturing of the vulva. The vigorous straining of the animal is chiefly due to the severe

inflammation and irritation of the part, the prevention of free drainage, stoppage of urine or acute constipation.

It is hoped that the method adopted and the success achieved by the writer in no less than 80 cases at this college, will appeal to his professional brethren. This article is confined to treatment and does not discuss causes and symptoms. The method of treatment is as follows:—

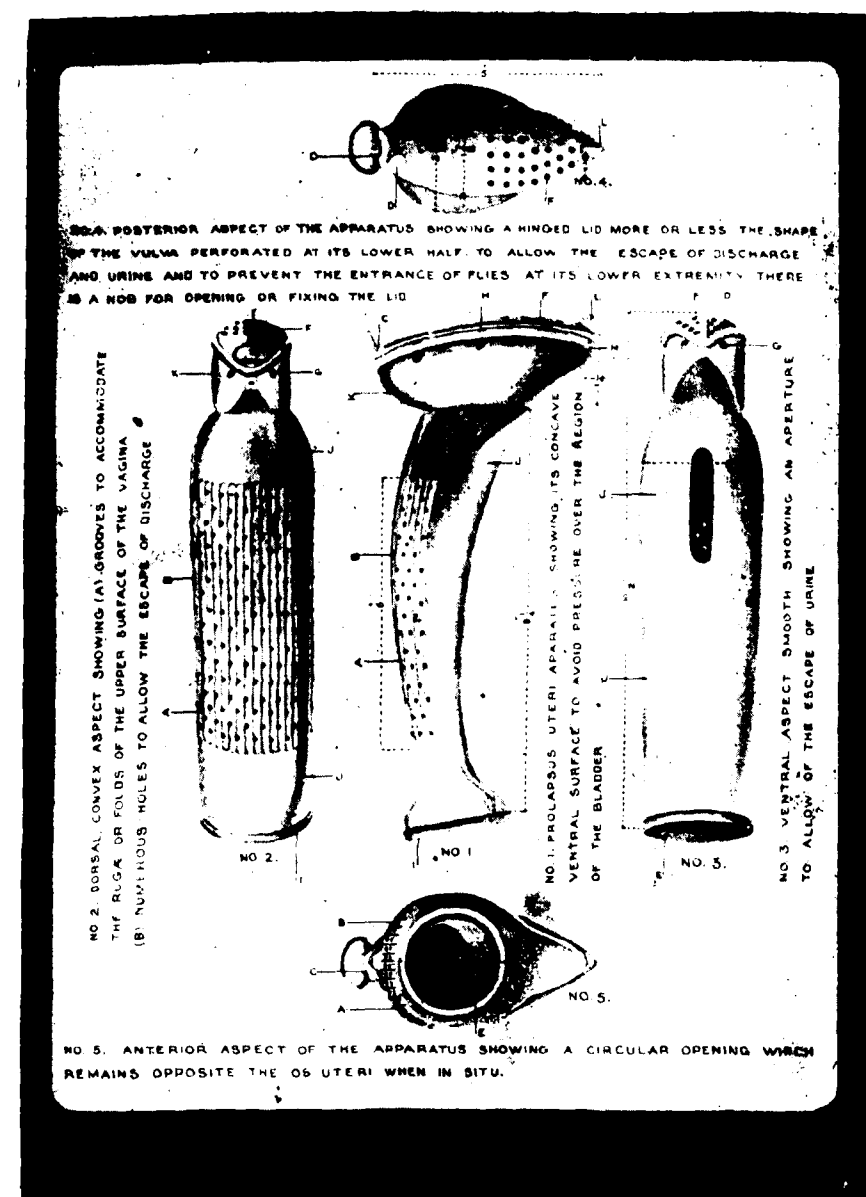
The prolapsed part is irrigated with cold water from half to one hour in order to lessen the congestion and to cleanse the part. When thoroughly cleansed the part is enveloped in a sheet of clean cloth and the patient is cast on a tarpaulin on the right side. Cushions made of gunny bags filled with straw are placed under the quarters. A dose of chloral hydrate is administered per oram or intravenously or the animal is chloroformed. The inverted organ is washed with potassium permanganate solution, one in 1500, or with some other suitable antiseptic such as $\frac{1}{2}$ per cent. solution of Electrolytic Chlorine, or Carbolic acid or Lysol. In fresh cases if any part is torn or ruptured it is carefully sutured with catgut ligature. In neglected cases any portion of the prolapse showing signs of sloughing, owing to the onset of gangrene or necrosis, is removed. If maggots are present they are removed. In such cases the prolapsed organ is then thoroughly washed with 2 per cent. zinc sulphas or alum lotion. In cases where the organ is enormously swollen and oedematous it is reduced in size by dusting finely powdered sugar over the prolapsed part and folding over the organ a sterilized wet sheet of long cloth and twisting the ends of this sheet about 20 minutes after the sugar is dusted. Kneading and applying pressure by one's hand is not always safe. The organ is then reduced in simple cases by pressing the fist against the most dependent part.

When the whole of the uterus is out it becomes a more difficult and laborious task but reduction can be effected by the following. The operator should place his right fist against the os-uteri, lifting the organ with his left hand, while the right side of the prolapsed part is supported by an assistant. The operator should now place his right elbow against the inside of his right knee, and another assistant should press both his hands against the knee from the outer side. The knee of the operator acts as a fulcrum and the power is provided by the assistant, who steadily pushes the operator's knee, while the latter returns the prolapsed uterus back into the abdominal cavity. This is easily accomplished during the intervals of straining. Moreover by employing this method, time and labour are reduced to a minimum.

When the organ is replaced it should be flooded with weak antiseptic solution to ensure that it is in its normal position. An apparatus made of suitable metal such as brass or aluminium, preferably the latter, of suitable dimensions according to the size of the animal is then inserted. If the apparatus is made of aluminium, it affords maximum strength with minimum weight and the finished apparatus can be highly polished in order to provide a uniform smooth surface, comfortable to the animal, easy to clean and not liable to tarnish.

The aluminium apparatus, an illustration of which is given, is open at the anterior part, and rests against the os-uteri, while the outer or the posterior end is provided with a suitable hinged lid capable of being securely closed by a catch. This lid prevents the entrance of flies, dust, dirt etc. The lower side or the ventral aspect of the apparatus which rests on the lower surface of the vagina is suitably concave to avoid pressure on the region of bladder. An aperture is provided on the ventral surface which comes in apposition with the sphincter of the bladder, to allow the urine and discharge to pass out through the apparatus. The dorsal aspect of the apparatus is convex, and is also provided with grooves to accommodate the rugae or folds of the upper surface of the vagina with numerous holes to allow free escape of discharge. The posterior end of the apparatus with a hinged lid resembles and conforms to the shape of the lips of vulva, and is provided with a number of holes along its outer rim to retain the apparatus in position by means of sutures passed through them to the lips of the vulva. The lid has a series of perforations in the lower half to allow the escape of discharge and urine. The extreme end of the apparatus is provided with grooves opposite the holes for embedding the sutures and allowing the lid to come in apposition with the rim of the apparatus. A ring has been provided on the top of the posterior end of the apparatus just in front of the hinge of the lid, for the purpose of fastening it to the body of the animal by means of a tape or truss. After inserting this apparatus the vagina and the uterus are irrigated with potassium permanganate solution or boric lotion. The animal is allowed to stand up and the apparatus is left in position from 2 to 4 days according to the severity of the case.

A laxative such as Sulphate of Magnesia or linseed oil should be administered to remove or prevent constipation. If the cow strains continuously anodynes such as Chloral, Pot. Bromide, Camphor, or Ext. of Belladonna may be administered internally every four hours. In such cases where there is severe continuous straining, tracheotomy should be performed. On the other hand, should the animal be very



Prolapsus Uteri Apparatus (Mushtaq's Patent).

weak and exhausted, alcoholic stimulants should be given. On the following morning, in cases where the temperature rises, Sulphate of Magnesia in small doses with Sulphate of Quinine and dilute Sulphuric Acid should be given twice a day.

The uterus is douched with warm Potassium Permanganate solution, 1 in 1500, or one per cent. Lysol, one to two per cent. common salt solution, or 2 to 3 per cent. Boric lotion, once or twice a day according to the condition of the case. The douching should be continued after removing the apparatus for several days till the discharge ceases.

CASES.

Two typical cases only, of the large number successfully treated at the Punjab Veterinary College Hospital, Lahore are here recorded in detail with photographs.

Case No. 1.—*Subject* :—Brown cow, aged 6 years.

Symptoms :—It was stated that the cow had calved two days previously and had not dropped the placenta, which was removed by a quack; four hours after the removal of the placenta, the uterus had everted. The animal was straining, and the prolapsed organ was bleeding, due to the friction caused by the movement of the tail and rubbing against the hard floor of the shed.

Treatment :—The subject was treated as described above. The apparatus was removed on the 4th day, and douching continued for a week. The cow was discharged cured on the 12th day.

Case No. 2.—*Subject* :—A grey cow aged 6 years.

Symptoms :—It was stated that the cow had calved in the normal position and that prolapse occurred after a few hours. She was acutely constipated, straining very hard and showing colicky symptoms. The uterus was hanging down and was soiled with mud.

Treatment :—The following draught was administered :—

R	
Sulphate of Magnesia	... oz. 12
Common Salt	... oz. 12
Chloral Hydrate	... oz. 1½
Treacle	... oz. 4
Ginger	... oz. 1
Water	... O. 2½
M. Ft. Haustus.	

Soap-water enema was given.

The reduction was effected by the method described above. The apparatus was inserted and kept in situ for 3 days and then removed. Douching was continued for 4 days and the animal discharged.

JL
KZ m2, n24

The above treatment has proved one hundred per cent. successful except in those cases in which rupture or perforation has occurred.

CONCLUSIONS.

This method of treatment is to be recommended for the following reasons:—

1. The apparatus supports the wall of the vagina and allows free escape of urine and discharge.
2. It does not damage the lips of the vulva like sutures, West's Clamp and trusses of various patterns.
3. The uterus can be irrigated with suitable antiseptics while the apparatus is in situ.
4. It does not allow the entrance of flies, dirt, dust, etc.
5. Eversion of the uterus cannot take place even if the animal were to strain violently.
6. It does not cause any injuries or metritis,
7. The apparatus is lasting, simple to use, and is sterilizable.

INSTRUCTIONS.

1. Thoroughly irrigate the the prolapsed part with cold water from $\frac{1}{2}$ to 1 hour in order to relieve congestion and cleanse the part.
2. A sedative such as chloral hydrate should be administered from 1 to 2 oz. in 2 pints of water with 4 oz. of treacle per oram, or 4 drams to 1 ounce in 3 to 6 oz. of sterile water intravenously, or the animal should be chloroformed.
3. Cast the animal on the right side and place cushions of gunny bags filled with straw under the quarters and place a sheet of clean cloth under the prolapsed part.
4. If the prolapse is much enlarged and oedematous dust finely powdered sugar on it and after about 20 minutes cover the part with a sterile sheet of long cloth, and twist the two ends of this. This process will reduce the oedema.
5. In fresh cases if any part is torn or ruptured it should be sutured with catgut ligature. Any portion of the prolapsed part showing signs of sloughing due to the onset of gangrene or necrosis should be removed.
6. The prolapsed part should then be subjected to a thorough douching with a reliable antiseptic lotion such as Pot. Permanganate 1 in 1500 or a weak solution of Lysol or $2\frac{1}{2}$ per cent. alum lotion, followed by the application of Glycerin Belladonna, or Glycerinum acidi-carbolici or camphorated oil.



Complete Prolapsus Uteri.
(Brown Montgomery Cow 6 years).



Complete Prolapsus Uteri
(A Grey Hissar Cow 6 years).



Apparatus in Situ for 4 days.



Apparatus in Situ for 3 days.



Twelve days after Recovery.



Seven days after Recovery.

7. The prolapse is then reduced by placing the right fist against the os, and holding the prolapsed part with the left hand. The assistant to hold and support the right part of prolapsed organ. The elbow of the operator should rest against inside of his right knee and another assistant should press with his both hands against the knee from outer side. This procedure will cause the prolapsed organ to revert in the quickest possible way.

8. When reduced, ascertain that the uterus is in the normal position by flooding the organ with a weak antiseptic solution.

9. The apparatus, No. 1 for buffaloes and No. 2 for cows, is then inserted as the case may be and secured in position by means of sutures passed through the 4 small holes situated on the posterior rim and the vulva and to secure and support the apparatus against displacement, it is fastened to the body of the animal by means of a tape or truss fastened to the ring provided on the top of posterior end of the apparatus.

10. The apparatus may be left in situ from 2 to 4 days.

11. The bowels must be kept in loose condition by the administration of linseed oil, or Sulphate of Magnesia combined with Extract of Belladonna and Luke-Warm enemas,

12. The uterus should be washed twice a day with weak salt solution or with Potassi Permanganas 1 in 1500.

13. The vulva with the apparatus in situ should be covered by means of a loose bandage to prevent the settling of flies.

14. To avoid straining the animal should be kept under the action of sedatives and anodynes such as chloral hydrate, extract of Belladonna, Camphor, Pot. Bromide. In severe cases of straining where these sedatives do not relieve the straining tracheotomy should be performed,

Note :—The apparatus No. 1 for buffaloes made of polished aluminium in a tin case . . Rs. 30 (£. 2-5) and apparatus No. 2 for cows made of polished aluminium in a tin case ... Rs. 22 (£ 1-13).

The apparatus can be purchased exclusive of postage and packing charges from Messrs. Allibhoy Vallijee & Sons, Manufacturers of Surgical Instruments, Hospital Aseptic Furniture, Steel Office Equipment, Alvi Works etc., Multan Cantt., Punjab.

RINDERPEST IN SHEEP, WITH A SPECIAL REFERENCE TO ARTIFICIAL INFECTION.

BY

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Natural infection of rinderpest among sheep seems a rare occurrence and only a few cases are recorded. Koch confirmed the experiences of the farmers of Orange Free State that the sheep could be put to graze with the affected cattle without contracting the infection, while on the other hand, rinderpest first appeared in numerous cases in herds of sheep and goats which had been kept separate from the large ruminants. He views that the infection starts first in a mild form with undiagnostic symptoms and gains in virulence as the disease progresses through the bodies of sheep. This suggests an idea that the outbreak in cattle which follows an outbreak among sheep may be a severe one. Koch records an outbreak among sheep in Africa after its disappearance in cattle. Hence outbreaks generally occur among sheep either before or after the outbreak among cattle but not simultaneously, which fact has been observed by many field workers in Mysore. An instance was cited by my colleague Mr. Kuppasawmy Mudaliar, that an outbreak of rinderpest occurred simultaneously among cattle and sheep in a village near Bangalore during the year 1925-26. Evans, S.A. (1931) puts forth the results of his experiments in which he says that sheep are refractory to rinderpest and act as reservoirs of Virus for short periods and do not contract the infection when kept in contact with affected bovines. He adds further that the satisfactory reaction of rinderpest for artificial infection could not be induced in weaned lambs. Robertson (1923) reports that an outbreak of rinderpest occurred among cattle during the year 1923 by the importation of sheep to Fremantle which carried the infection. In view of the above facts it is probable that the sheep act as carriers of rinderpest.

The severity of the infection among sheep in Mysore, is observed to be very high and mortality ranges from 80 to 90 per cent. The reason for this high susceptibility of sheep in Mysore to rinderpest may be due to the fact that cattle and sheep do not generally mix and graze together. Moreover the sheep are always penned outside the village, away from the cattle and they are not subjected to frequent movements from village to village as it is in the case of cattle which come in the sphere of getting a chance of infection by frequent mobilisation. By this reason, cattle have a chance of acquiring a mild infection by frequent exposure to the disease thus getting a sufficient

immunity to withstand the infection in an outbreak, whereas, sheep are devoid of this benefit.

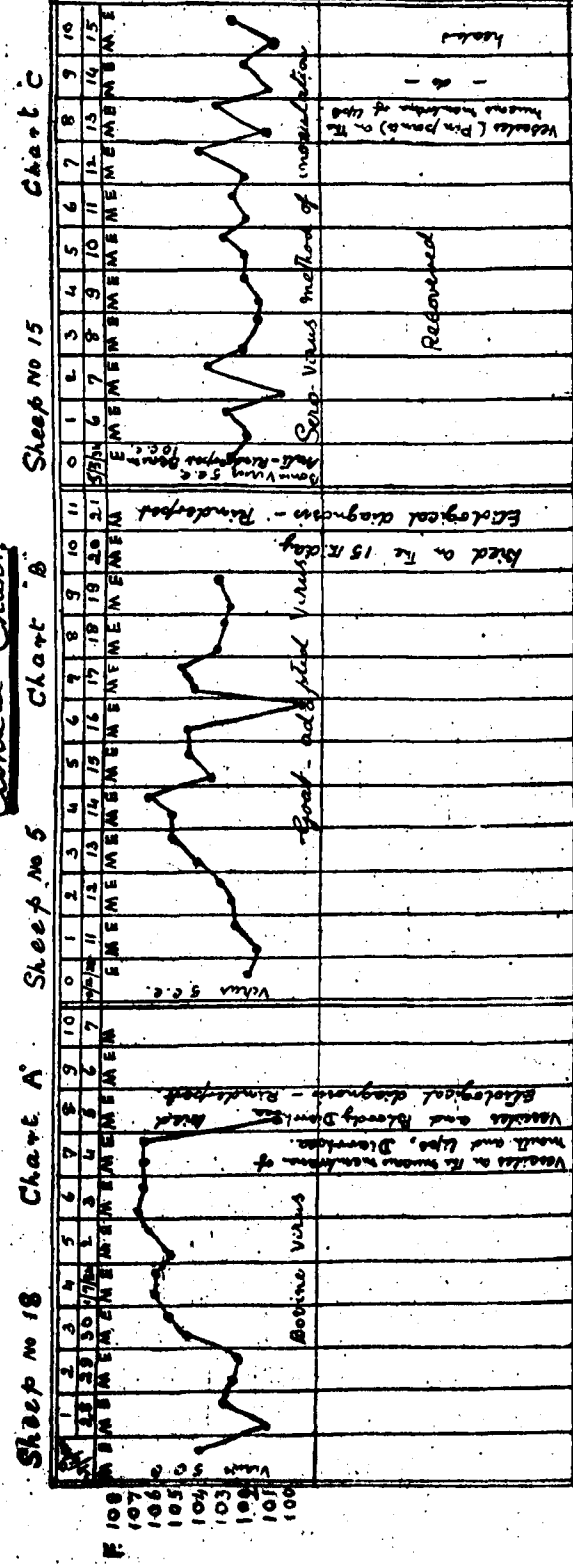
Artificial infection of sheep with Bovine Rinderpest Virus.—Koch's experiments (1897) of artificial infection of bull virus to Marine and Cape sheep proved that the sheep took a severe turn of the disease and when the virus was passed from sheep to cattle, it was rendered more acute for cattle. Hence the hope of using sheep for attenuation of virus was abandoned. Koe and Turner recorded that even though the reaction among sheep, following an inoculation of rinderpest blood, is only an elevation in temperature with a moderate general disturbance still the virus multiplies rapidly within their bodies and may even attain high virulence.

During the latter part of June 1934, the strain of bovine rinderpest virus maintained in the Institute seemed to fail to infect the buffalo calves (Virus producers). At the instance of Mr. S. D. Achar, Superintendent, the virus from two buffalo calves was withdrawn on the fifth day when the thermal reaction was 101.0°F and 103.4°F respectively. Three sheep were injected with the mixed virus of the two samples with a view to exalt the Virus. All the three sheep took the infection after a short period of incubation. One sheep exhibited thermal reaction only and the other two showed both thermal and clinical reactions and the thermal reaction being a rise of 3 to 4.5°F from normal. The clinical lesions were identical with those observed among cattle. Virus from one of the two latter sheep was withdrawn at the height temperature on the fourth day and a batch of five buffalo calves was infected. This donor (sheep) died on the eighth day after the infection with characteristic rinderpest syndrome (Vide Chart A). Virus from these reacted buffalo calves was made use of, for maintaining the strain of virus satisfactorily at the Institute by passaging through buffalo calves. (Vide Table 1).

TABLE 1.

REACTION.		REACTION.	
Virus from	Buffalo calf No. 1040	Thermal 101°0°F.	Sheep No. 17 Thermal 104°4°F.
	do.	" 1041 Thermal 103°4°F. and clinical.	do. Thermal 100°8°F. and clinical.
	do.	" 1041 Thermal 103°4°F. and clinical.	do. Thermal 102°8°F. and clinical.
	do.	" 1041 Thermal 103°4°F. and clinical.	do. Thermal 104°4°F. and clinical.
	do.	" 1041 Thermal 103°4°F. and clinical.	do. Thermal 103°2°F. and clinical.
		do.	do. Thermal 104°6°F.

Clinical Chart



Rinderpest in sheep with a special reference to Artificial Infection.

Infection with Goat adapted Virus.—Major Stirling (1933) reports the experiences of Pani (1932) who tried to use sheep in place of goats to cultivate and maintain the goat virus on the field. The sheep developed symptoms of acute rinderpest on or about the 5th day with fatal results. Hence the idea of substituting sheep for goats was given up.

To study the nature of reaction in sheep by goat virus and to ascertain whether they can be safely immunised against rinderpest with goat virus alone or whether anti-serum is necessary with virus simultaneously, a batch of six sheep was infected with goat virus (58th passage of Fixed Virus). All the sheep took the infection and gave a typical reaction of rinderpest, one of them showing the peak of temperature curve at 106·0°F on the fourth day after infection (Vide Chart B). Three sheep succumbed to the disease. Post-mortem finding resembled those of cattle which died of rinderpest. But instead of the usual ulceration on the mucous membrane of the alimentary canal, only congestion and sub-mucous haemorrhages were noticed. No pneumonic changes were noticed in the lungs as is usual in goats affected with rinderpest. Interstitial emphysema combined with anaemia of lungs was marked.

By these results, it appears that a dose of anti-serum is indicated with goat virus whenever sheep are to be immunised against rinderpest as the use of "goat virus alone" is unsafe.

Sero-Virus method of inoculation.—It is a routine practice in the Institute to protect, at the onset, all the sheep that are brought for experiments other than rinderpest, by serum simultaneous method of inoculation using bovine virus.

All the sheep that were thus protected have shown almost blocked out reactions (Vide Chart C) or mild thermal reactions only, in fact, the type of blocked out or a very mild reaction that is looked upon as the ideal in the serum simultaneous inoculation against rinderpest (Cooper 1931).

Resuscitation of protozoa in the blood also occurs among the sheep reacting to rinderpest. During the reaction period in the sheep infected with goat adapted virus, blood revealed *Babesia motasi* Wenyon 1926 (Achar, S. D. & Srikantaiah, G. N. 1934) which aggravated the disease.

CONCLUSIONS.

(1) Natural occurrence of rinderpest among sheep is rare and when the outbreak occurs it may precede or follow the outbreak among cattle but simultaneous occurrence is rare.

(2) Rinderpest virus is exalted when passed through the bodies of sheep.

(3) Sheep are highly susceptible to rinderpest.

(4) Prophylactic inoculation against rinderpest with goat adapted virus alone is not safe for sheep and a dose of anti-serum has to be given simultaneously with either bovine or goat virus.

(5) Post-mortem changes resemble those of cattle and the lungs do not exhibit pneumonic changes as in goats affected with rinderpest.

ACKNOWLEDGEMENTS.

It is my pleasant duty to place on record my grateful thanks to my chief, Mr. S. D. Achar, who afforded me all facilities to carry on the experiments. My thanks are also due to Messrs P. U. Nayar and K. Ranganatha Rao for having kindly gone through the paper.

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FISTULA OF THE CORONARY BAND OF THE HORSE.

By

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In the cold latitudes where the temperature ranges from 32° F. to below zero for five months or more of the year—fistula of the coronary band of the horse is very common. The ice and snow continuously covering the ground maintains a near freezing point at the junction of the hoof and the soft structures. This condition impairs blood circulation and the slightest injury to the band results in necrosis. The applied cold continually is also conducive, by blocking the vein valves and capillaries. When warm weather returns the circulation is not wholly established—there are small areas left out in which structural changes occur resulting in death of the part. Greaseheel is primarily from the same cause—secondarily from infection.

The successful treatment of fistula of the coronary band is simple and safe—far superior to the liquid preparation in common use. With a stilet made of some hard wood—four inches long with the small end flat and round about the quarter inch across—the slope from end to end, the larger end, say five eighths or three quarter of inch—inserted into each fistula tract. (The object is to enlarge tubes and get to bottom of them) rotate the stilet as you bring pressure to insert. This done, place a piece of Bichloride of Mercury in tract and push with stilet the piece to the tract's bottom. Repeat until the tube is filled to the skin surface—pack in all the tube will hold—Fill every tract the same way—place one layer of bandage around coronet—tie same at front of foot. The lump mercury should be crushed into suitable sizes before you begin to pack in order to proceed rapidly with the packing. The first piece of mercury put in usually makes the tube so dry that delay makes the balance difficult to insert. In 24 to 36 hours a perfect cast of all the diseased area can be removed with a pair of broad jawed forceps, leaving a depression, the surface of same being healthy-rosy-with luxuriant granulations which close the opening rapidly in 12 to 48 hours. Further treatment is absolutely unnecessary. The mercury bichloride never attacks the healthy tissues in these cases. The rapid absorption of it by the necrosed tissue prevents the dissolving of more than is taken up by the diseased—constitutional effects are never a result.

Anatomical Section.

NO. 17. THE FORMATION OF THE SUPRA AND SUBCARPAL ARCHES AND THE DISPOSITION OF THEIR BRANCHES.

By

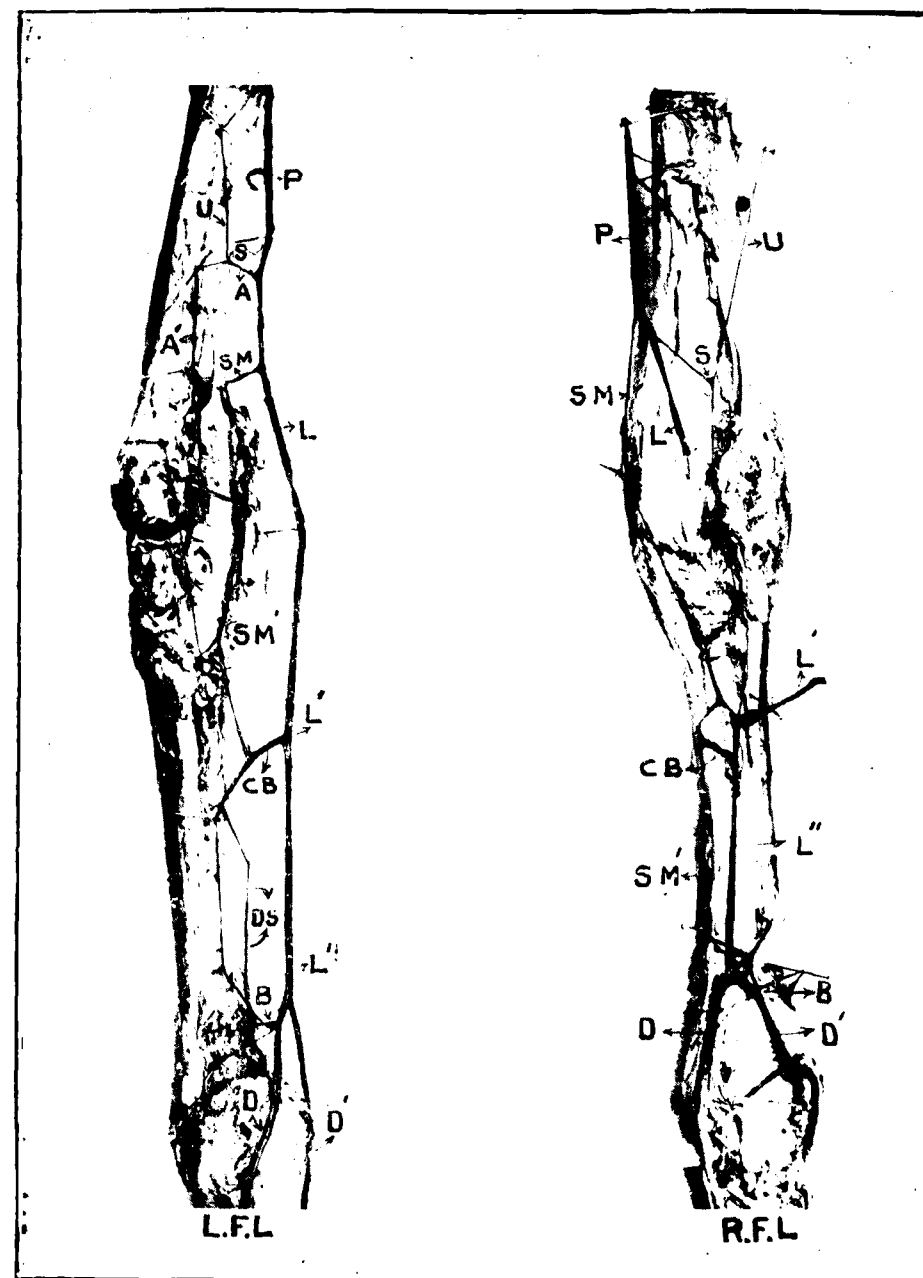
H. N. CHELVA IYENGAR, G.M.V.C.,
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Usually, the posterior radial artery divides about the lower third of the fore-arm into two branches of unequal size—Small and Large metacarpal arteries. In some cases the posterior radial artery detaches a branch which joins the termination of the ulnar artery to form the supracarpal arch.

Usually, the large metacarpal artery—the larger of the two terminal branches of the posterior radial artery, descends in company with the flexor tendons by passing behind the carpus beneath the carpal arch. Emerging from beneath the carpal arch, continues to descend on the inner side of the flexor tendons until a little above the fetlock where it sinks slightly inwards to bifurcate into two digital arteries. Only two of its branches are of sufficient size to merit description and both are somewhat irregular in their origin. The first of these comes off near the origin of the parent vessel or may come off from the posterior radial itself. This anastomoses with the termination of the ulnar artery to form the supracarpal arch. The second is also an unnamed vessel springing from the large metacarpal artery at or near its point of bifurcation and divides into branches that ascend to anastomose with the interosseous metacarpal arteries.

The supracarpal arch is formed behind the lower extremity of the radius, usually by the junction of the first branch of the large metacarpal artery with the termination of the ulnar artery (or sometimes with a branch of the posterior radial itself). From the convexity of this arch there arise several branches. The largest and the most regular of these descend through the carpal sheath and joins small metacarpal artery to form the subcarpal arch.

The small metacarpal artery—the smaller of the terminal branches of the posterior radial artery, usually behaves in the following manner:—It descends behind the carpus towards the inner side and is superficially placed. At the level of the head of the inner small metacarpal bone it crosses to the outer side by passing between the suspensory and subcarpal ligaments. It here anastomoses with a



L. F. L. : left fore limb ; R. F. L. : right fore limb ; U, ulnar artery ; P, posterior radial artery ; S, supracarpal arch ; A to A' in L. F. L. : articular branch to the carpus ; L, L' and L'' : Large metacarpal artery ; SM to SM' small metacarpal artery ; C. B. : communicating branch from L. ; B : branch from external digital ; D and D' : Digital arteries ; D. S. in L. F. L. : divisions of small metacarpal artery.

branch already described above as descending from the supracarpal arch. The subcarpal arch is formed in this way.

This subcarpal arch gives off two pairs of branches—anterior interosseous metacarpal and posterior interosseous metacarpal arteries. These two pairs in their turn descend and branch. These branches anastomose with the branches of the second unnamed branches of the large metacarpal artery.

The following are the findings with reference to the formation of the supra and subcarpal arches and the disposition of their branches in the fore limbs of a pony (dissected on 25—11—31):—

Right fore limb.—The formation of the supracarpal arch was as usual. But the small metacarpal artery instead of terminating below the carpus by forming the subcarpal arch, was found giving off a branch below the carpus and this branch joined a branch descending from the supracarpal arch and formed the subcarpal arch. The small metacarpal after detaching the branch towards the formation of the subcarpal arch continued down the metacarpus as the internal posterior interosseous metacarpal artery. The inner anterior interosseous metacarpal artery was found to be a branch from the small metacarpal artery and detached a little below its branch which contributed to the formation of the subcarpal arch. A similar behaviour of the small metacarpal artery was observed by me for the first time in the left fore of a subject dissected in February 1930. (*Vide* my article No. 15—Plate XV, I. V. J., Vol. X No. 3, P. 237). The outer anterior and posterior interosseous metacarpal arteries of this limb were found as usual to come off from the convexity of the subcarpal arch.

The large metacarpal artery communicated with the internal posterior interosseous metacarpal artery by a large branch at the back of the upper third of the large metacarpal bone.

The usual lower unnamed branch of the large metacarpal artery was wanting but was compensated for by a branch from the external digital artery. (*Plate XVII—R. F. L.*)

Left fore limb.—A large branch was found detached from the posterior radial artery a little above the lower third of the radius. This branch after its origin from the posterior radial gave off (*a*) a number of Muscular branches to the Deep Flexor; (*b*) a narrow branch which, with the termination of the ulnar artery formed the supracarpal arch. The large branch after detaching branches (*a*) and (*b*) placed itself on the back of the radius and continued down to the carpus as “articular branch to the carpus.”

Division of the posterior radial artery into its terminal branches—large and small metacarpal arteries was found to be about $1\frac{1}{2}$ inches

below the level of the formation of the supracarpal arch. This peculiar formation of the supracarpal arch was noticed in this subject for the first time. Another peculiar formation of this supracarpal arch formed by a branch from the small metacarpal artery with the ulnar artery was noticed in the right fore of a subject dissected on 25-10-29, and has been described in my article No. 8 with Plate IX, I. V. J. Vol., IX, No. 3, P. 197.

The first—the upper unnamed branch of the large metacarpal artery was wanting.

The small metacarpal artery after it contributed towards the formation of the subcarpal arch by giving off a small branch at the usual level, continued down the metacarpus and received a large communicating branch from the large metacarpal artery. The small metacarpal artery divided below this point of communication into two nearly equal branches which hereafter took the place of external and internal posterior interosseous metacarpal arteries.

The lower unnamed branch of the large metacarpal artery was wanting but it was compensated for by a branch from the external digital artery which behaved in a manner similar to the usual lower unnamed branch. (Plate XVII—L.F.L.)

Clinical Articles.

A CASE OF SCHISTOSOMIC DYSENTERY IN A DOG.

BY

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

Veterinary Assistant Surgeon, Ootacamund.

Cases of dysentery in dogs are fairly common on these hills and the causes of the same are many and varied. The following case is, however, unique in my experience as the causal agent was a Schistosome; hence it is recorded.

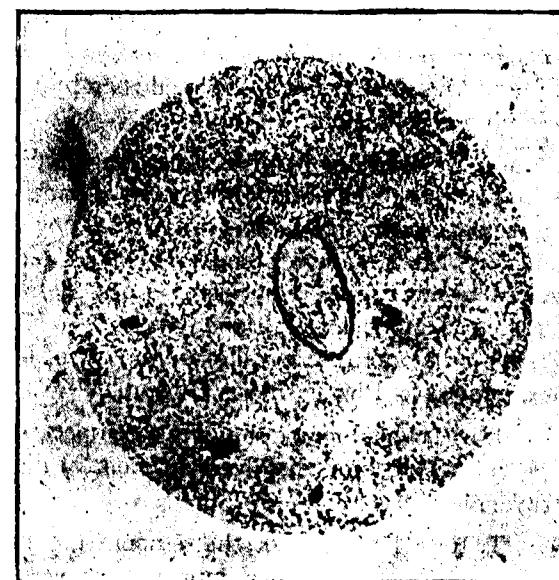
The subject of the case is a Spaniel Dog, aged about 15 months, belonging to a gentleman now residing in Kotagiri (The Nilgiris), but who was all along in Jubbulpore (North India). This gentleman had lost 4 of his dogs during the past three years from a complaint which, according to him, was similar to the one now recorded.

On May 28th, 1934, this gentleman brought the above mentioned Spaniel to me with the history that it was having dysenteric motions off and on for the past six months, that the complaint first started in Jubbulpore and that it was continuing still even after his change to

Kotagiri. The dog had a fairly good appetite, but, in spite of good feed and nourishing, the dysentery continued and the dog was declining very rapidly in condition. The gentleman also gave out that all the dogs he had lost showed the same symptoms and that they died in spite of every treatment. Straining was always great, the mucus-tinged motions being passed more often than blood-stained ones.

On examination, the dog looked poor in condition, with ribs showing very much. The coat was very staring and without any gloss. The temperature was normal and the dog appeared to be fairly in good spirits—in fact there were no acute symptoms. The affection was evidently chronic.

A sample of the mucus-tinged stools was examined immediately under the microscope when numbers of ova of Schistosomes were found. These were very kindly identified as ova of Sch. Suis by M. R. Ry. M. Anant Narayan Rao Avl., Lecturer in Parasitology, Madras Veterinary College.



Ovum of Schistosome Suis in a dog.

As I had not met with any case of Schistosomal dysentery in dogs before and as no mention of it was to be found in any text books, the treatment of the case became very difficult.

To start with, a mixture containing small doses of Mag. Sulph. Sodi. Sulph. and Acid Sulphuric Dil was given for a few days after which the dog was put on a course of Triple Sulph. mixture contain-

ing Quin. Sulph. Ferri Sulph. and Mag. Sulph. Intravenous injections of Tartar Emetic so much recommended for Schistosomic infections in other animals could have been tried but, as I had to leave the station quite suddenly, it was not. However, the dog improved on the above treatment and, when last seen by me on the 18th August 1934, there was a decided and marked improvement. It had a fine coat and its condition was good. Still, the dysenteric motion had not completely stopped, although, according to the owner, it was less frequent.

The case is still under observation and a further report will be published later on.

TREATMENT OF "PIROPLASMA GIBSONI" WITH SULFARSENOL.

BY

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Assistant Veterinary Surgeon, Narayanaguda, Hyderabad, Deccan.

I used sulfarsenol in the treatment of canine piroplasmosis for the first time and the good result I obtained thereby induces me to record the following observations:—

Case No. 1.—A Solukhi dog (Afghan hound) aged about fourteen months, imported to this place about three months back was brought to me for treatment with the history that the dog was losing condition and very often refused food. He had a temperature of 105° F; pulse and respiration were accelerated, the abdomen tucked up, urine high coloured, mucous membrane pale and the dog was fully infested with ticks. The microscopical examination of blood smears confirmed the diagnosis as Piroplasmosis Gibsoni.

On 31—8—34, when the dog was showing a temperature of 104°F, 6 cgm. (No. 1) of sulfarsenol dissolved in 3 c.c. of distilled water was given intravenously.

- 1—9—34. T. 102°6'F. Though the temperature had fallen no other improvement was observed.
- 2—9—34. T. 104°2'F. Condition remained as before.
- 3—9—34. T. 102°4'F. Second injection of 12 cgm. (No. 2) was given intravenously.
- 4—9—34. T. 104°4'F. No change in condition.
- 5—9—34. T. 103°2'F. Slight improvement in general condition was noticed.

Treatment of "Piroplasma Gibsoni" with Sulfarsenol 115

- 6—9—34. T. 103°4'F. Third injection of 18 cgm. (No. 3) was given intravenously.
- 7—9—34. T. 104°8'F. Though there was a rise in temperature no other constitutional disturbance was seen.
- 8—9—34. T. 103°8'F. Much improvement was noticed in general condition.
- 9—9—34. T. 103°F. Appeared still better.
- 10—9—34. T. 102°F. There was further improvement.
- 11—9—34. T. 103°F. Further injection of sulfarsenol 30 cgm. (No. 5) was given intravenously.
- 12—9—34. T. 102°2'F. The blood smears were again examined and found free of parasites.

Subsequently the animal was keeping normal temperature showing marked improvement in general condition day by day.

Case No. 2.—This was a sheep dog aged about nine months. He was brought to the dispensary with the history that he was restless and losing condition. Ordinary febrifuges were tried for a few days as he was showing temperature ranging from 104° F. to 105° F.

On further examination slight enlargement of the spleen and liver was noticed. A few ticks were also present on his body.

Microscopical examination confirmed the diagnosis as Piroplasmosis Gibsoni.

Four injections of sulfarsenol 6 cgm., 18 cgm., 24 cgm., and 36 cgm., (Nos. 1, 3, 4 & 6) were given on 5th, 7th, 10th and 17th September 1934, respectively. The first injection was given when the temperature was 104°8'F, and it remained almost the same until the second injection but later on it began to decline and came to normal after the 4th injection when the blood was also found free of parasites.

In addition to sulfarsenol, both cases were getting quinine, salol and other diaphoretics at the height of the fever and subsequently tonics consisting of iron and arsenic.

Conclusion:—These were the first two cases of Piroplasma Gibsoni and I proposed to treat them with sulfarsenol. There was no bad affect whatsoever, I am of opinion that three or even two injections may effect a cure provided the treatment is started early and with a fairly big dose, though it may be advisable to start with smaller doses.

Acknowledgement:—I express my thanks to Mr. M. R. Mahajan, M.R.C.V.S., Veterinary Investigation Officer of this state for having kindly confirmed my diagnosis, after examining the blood smears of the dogs.

A CASE OF SUPPRESSION OF URINE IN A BUFFALO.

BY

G. SEETA RAMA MOORTHY, G.M.V.C.,
Veterinary Assistant Surgeon, Koraput, Madras.

History of the case:—The case was an eight year old cart buffalo of Salur, bound for Jeypore, which according to the owner had suffered from foot and mouth disease the previous month when it was working in the plains. Due to that attack the buffalo was much debilitated and as the cart-man entirely depended upon the cart hire, he could not afford to give the animal sufficient rest to recoup its health. He began to work it soon after its recovery.

On the advise of other cart-men he began feeding the buffalo with black variety of kulti in half seer dose from 2--4--33, because of a belief in the plains that this black variety of kulti acts as an antirheumatic, tonic and stimulant. He noticed that it had suppression of urine from the afternoon of 5--4--33. In this condition the animal was brought for treatment on 7--4--33.

Symptoms:—The temperature, pulse and respirations were found to be normal. The buffalo was feeding well and passing normal amount of dung and drank its usual quantity of water.

The animal was given a subcutaneous injection of Dieuretin 30 grains in Aqua Distillata 30 c. c. The injection was given on 7--4--33, at 7 p.m. and at 7.40 p.m., the animal passed about 1½ gallons of deep straw coloured urine. During the later part of the night there was scanty urination, hence the injection was repeated at 1 a.m. and within half an hour after injection the buffalo passed another gallon of urine. During the early hours of the day, it passed a moderate amount of urine. The peculiarity of the case was (1) the absence of any discomfort by the suppression of the urine for two days, (2) the prompt action of dieuretin in this case.

EPISTAXIS IN A BULLOCK AND ITS TREATMENT WITH ATROPINE SULPHATE.

BY

B. M. LAHIRI,
Touring Veterinary Assistant Surgeon, Nawada, Gaya,
Bihar & Orissa.

Subject:—A gray country bred bullock, belonging to a local cultivator.

History:—The animal was first brought with the history that it was off-feed and on examination it was found to have fever. Febrifuge medicines were supplied to the owner. After a week and a half it was again brought to the dispensary with the following symptoms:—There was severe bleeding from the nostrils, clots of blood came out when the animal sneezed. The blood was bright red in colour and foamy. There was an occasional cough present. The breathing was hard and sterterous. No apparent cause could be ascertained.

Treatment:—Irrigation of the nose with cold astringent styptic lotion was tried thrice daily for three days. This did not prove effective as the bleeding stopped only temporarily. On the 4th day morning 1/5 gr. Atropine Sulph. in 2 c. c. distilled water was injected subcutaneously. Improvement was noticed from that evening. The bleeding became less in quantity and the other symptoms such as hard breathing, sneezing and coughing also abated. By the next morning the bleeding totally stopped and the animal was alright.

ANAPHYLACTIC SHOCK DUE TO MILK INJECTION IN CASES OF YOKE GALL.

BY

B. M. LAHIRI,
Touring Veterinary Asst. Surgeon, Nawada, Gaya, Bihar & Orissa.

I had occasion to treat four cases of yoke gall in bullocks with milk injection as a trial in this dispensary.

The subjects were cart bullocks, which had developed tumours on the neck. They all had the tumours for some length of time before they were brought for treatment.

The tumours were of large size and had to be operated. Along with the surgical treatment, I gave them a course of milk injection. Of these 4 bullocks, 2 developed the following symptoms just after the injection was given.

No. 1 bullock:—Shaking of head, protrusion and rolling of the eye balls: staggering. These symptoms passed away after about

2 minutes, but reappeared in very slight degree soon after the later injections.

No. 2 bullock :—Soon after the injection, there was rolling of the eye balls, shivering of the whole body and staggering of such extent that the animal very nearly fell to the ground when made to walk. The symptoms lasted for 5 minutes, followed by 5 or 6 motions, which were semi solid at first, then liquid and the last was blood tinged. The animal became so much depressed that I had to give it stimulants &c., to counteract the symptoms.

Hence, it would appear, that injections of milk may sometimes produce very grave symptoms.

VALVULAR DISEASE OF THE HEART IN A HORSE.

BY

SENA PATI, L. V. P., *Gujranwala (Punjab).*

On 11—6—34, while inspecting as usual the horses in my charge on their return from the morning exercise, I suspected one of the horses to be going lame off hind. The horse was a Government stallion, Thoroughbred English, "White Friar" by name. His age was about 15 years and his condition quite satisfactory.

History :—The syce was asked to break off from the file and trot the horse. He abducted his right hind leg and brought it forward in a circular fashion. On examination of the leg, nothing abnormal was found. However, I let him off to his stable, keeping him under observation. Next morning I was informed that the horse had gone off feed partially.

During the course of diagnosis, I found the following on cardiac auscultation :—The systolic sound began somewhat violently and soon merged into a sound resembling that of a distant water-fall. The diastolic sound was normal, and the interval between the two sounds was distinct.

Diagnosis and discussion :—At the first instance, it was thought to be a temporary change. The animal was watched for more than six weeks ; but the cardiac derangement persisted. It was distinctly a systolic effort indicating :—

- (a) Either a stenosis of an artery, or
- (b) Insufficiency of auriculo-ventricular valves.

Rectal exploration of iliac arteries was carried out with no change in pulsation. To support this latter view, pulse, was felt simultaneously auscultating the heart. Both these excluded the stenosis of the aorta and the disease was diagnosed as " Insufficiency of the

auriculo ventricular valves." Which of the valves—right or left are involved is rather difficult to say.

It may be remarked that no special symptoms were noticeable in the case, other than those found on auscultation.

This disease has been recorded on his history sheet. His exercise has been reduced and ration suitably adjusted.

I wish to thank Capt. Kingston, R.A.V.C., who, upon my request, examined the case, and confirmed my diagnosis.

URETHRAL CALCULUS IN ITS MAKING.

BY

SENA PATI, L.V.P.,
Gujranwala (Punjab).

Hi story :—I was urgently called to see a small American pony, 'Sham,' which was showing acute colicky symptoms. He had not passed urine, for a long time, I at once went to examine him.

Discussion and diagnosis :—Colicky symptoms were confirmed. He occasionally tried to pass urine, but could not. On rectal examination, the bladder was found to be quite full and as hard as a wooden board. Besides this, the rectum was full of faecal balls, hard like bullets.

Colic due to the retention of urine, was the diagnosis.

On trying to find out the specific cause for retention, I palpated the urethra. It was also full, leading me to explore the anterior part near the glans penis. Urethral process was found to be abnormally large and swollen. The meatus was blocked by a gritty yellowish-grey material.

Treatment :—

- (i) Blockage removed.
- (ii) Warm enemata given.
- (iii) Lumbo-sacral part and perineum fomented.

The urine began to dribble, and later developed into a fine jet thrown at an angle. I waited to see the urine flowing freely. But it did not. Enquiry from the attendant elicited that he always passed urine in that manner, ever since the pony was in his charge. The distension of bladder became less and the pony was much relieved. Following was given internally :—

R

Ol. Terebinth. with ... oz 4.
Ol. Lini. ... oz 10.
M. Ft. haustus.

From the nature of flow of urine, it was definitely decided that there was some stricture of the urethra. He was to be examined at some other time.

Following morning, there was retention of urine again.

The calibre of the urethra being too small for a catheter, a probe was passed to clear the blockage, if any. To my surprise, a large amount of yellowish-grey gritty material came out. The urine began to flow in normal gushes. The passage was reprobated to remove the remaining particles if any and douched thoroughly afterwards.

It is a month since and the pony is doing quite well now.

A CASE OF FILARIA MEDINENSIS IN A DOG.

BY

N. C. CHIKMATH, G. B. V. C.,
Veterinary Surgeon, Kolhapur.

Subject:—A grey hound, aged four years, belonging to 'Pisal Brothers'.

History:—The animal was admitted for treatment as an in-patient at this hospital on 26—5—34, with a swelling over the right fore carpal joint. On enquiry the owner told me that a small swelling appeared on the right fore carpal joint, a month ago and appeared to increase in size daily.

Diagnosis:—The swelling was soft and painful and on exploration revealed pus inside, hence it was diagnosed as an abscess.

Treatment:—The abscess was opened and the cavity was syringed with antiseptic lotion. While syringing the cavity, a small length of what appeared to be a worm was observed. This was slowly pulled out till about 9 inches of it extended outside. It was thought that the worm was *Dracunculus* and the extending portion was wound round a small stick and left at the opening. The foot was bandaged.

Next day, (27—5—34), the joint was swollen considerably and the dog was unable to bear any weight on it. Thinking that a simple bandage would do no good, I applied guinea-worm ointment prepared by Messrs. Ajagarni & Sons, Belgaum. Next day (28—5—34), to my great surprise, the remaining worm came out of its own accord and the swelling over the joint subsided to its normal size. I continued the applications for three days. The dog got cured completely and was discharged on 31—5—34.

N. B.:—The ointment prepared by Messrs. Ajagarni & Sons Belgaum is named "Naroocha-Vairi."

BURSATI SORES AND IODINE THERAPY.

BY

R. D. SINGH,

Veterinary Assistant Surgeon, Supaul, Bihar & Orissa.

There is no definite line of treatment for Bursati in animals, not because it has baffled the researches of veterinarians in this direction but mainly because owners of the diseased animals very seldom bring them for treatment to hospitals. The visitation of this disease is generally looked upon by them as due to the influence of evil spirits, which, according to the common belief, could be cured only by exorcism. This notion on the part of the owners leads to the animal remaining uncared for and unattended to by any professional men, often resulting in loss to the owner. Moreover in mofussil hospitals no definite line of treatment is adopted and records kept with a view to arrive at any definite conclusion. In 1931, however, a circular was issued by Mr. I. Malik, Special Officer, Civil Veterinary Department in charge of North Bihar Range, suggesting treatment of this disease by Iodine solution and since then, the writer of this article has been carrying on experiments with this solution injected intravenously. This article deals with two cases treated in 1933, as in-patients in Supaul Hospital, where they were completely cured and discharged.

Case No. 1:—Animal—A Bay Indian horse, aged about 6 years.

Symptoms:—Bursati sore on the off-fetlock full of canker and very unhealthy to look at. The wound was an ugly sight, about ten inches in diameter, and extended over the joint. Round about it there were several fibrous tumours of small size. The sore according to the history given by the owner, was about a year old.

Treatment:—The wound was washed and the canker removed surgically and it was dressed with a solution made up of equal parts of Tr. of Iodine and Tr. Benzoin. The following preparation was made and two drachms per dose well diluted was given intravenously.

R		
	Iodine	... 24 gr.
	Pot. Iodide	... 36 "
	Distilled water	... 10 oz.
	M. Ft. mist.	

2 dr. of the above solution diluted with 1 oz. of distilled water was injected intravenously. The injection was repeated daily in the morning for 8 days. The first injection was given on 26—6—33, and continued for 4 days when symptoms of iodism appeared. The injection was then discontinued for 6 days and again from 6—7—33, it was continued for 4 days up to 9—7—33.

Sl. No.	Subject.	History.	Symptoms.	Name of the owners & Residence.	Treatment adopted.	No. & date of injection.	Date of discharge.	Remarks
1.	A. Bey. C. B. H. aged about 6 years	The animal was admitted as inpatient on 26-6-33.	Bursati wound on the off fetlock full of canker very unhealthy to look at. There were fibrous tumours	Mohamad Mian of Mahua	Canker & the fibrous tumours were surgically removed and the part was dressed with equal part of Tincture Iodine & Tr. Benzoin. Iodine was injected intravenously as described.	8 (From 26-6-33 to 29-6-33 & again from 6-7-33 to 9-7-33 one injection daily.)	10-7-33	Cured
2.	A Bhutia pony aged about 10 years	Do. on 11-7-33.	Do. on near fetlock	Mabgu Sah of Lilja	Do	17 (From 11-7-33 to 19-7-33 & again from 30-7-33 to 27-8-33)	6-8-33	Do
3.	A. Bey. C. B.H. aged	Do. on 12-8-33. having Bursati on N. H. fetlock	Do	Musadi Sahu of Chaugbara	Do	11 (From 4-8-33 to 19-8-33 & again from 25-8-33 to 27-8-33)	27-8-33	Do
4.	A. Bey. C. B.H. aged about 4 years	Do. on 14-8-33. having Bursati on the off knee	Do	Geni Sahu of Sabtari	Do	9 (From 4-8-33 to 19-8-33 & again from 6-9-33 to 9-9-33)	9-9-33	Do
5.	A. Bey. C. B.H. aged about 9 years	Do. on 3-9-33. Bursati wound on N. H. fetlock	Do	Guli Singh of Sabtari	Do	11 (From 3-9-33 to 8-9-33 & again from 14-9-33 to 18-9-33)	18-9-33	Do

Sl. No.	Subject.	History.	Symptoms.	Name of the owners & Residence.	Treatment adopted.	No. & date of injection.	Date of discharge.	Remarks
6.	A. Bey. C. B. pony aged about 7 years	Do. on 17-10-33. Bursati on off knee	Do	Hari Mandal of Sabtari	Do	12 (From 17-10-33 to 24-10-33 & again from 28-10-33 to 30-10-33)	2-11-33	Cured
7.	A. Bey. C. B.H. aged	Do. on 16-11-33. Bursati wound on off quarter	Do	Bhupal Singh of Koelari	Do	12 (From 16-11-33 to 23-11-33 & again from 3-12-33 to 6-12-33)	8-12-33	Do
8/9	2 Bhutia ponies.	Do. on 1-2-34. having Bursati wound on the inner canthi of both eyes	Do	Chandra Bahadur of Sabtari	The animals were treated only with intravenous injection of Iodine & the affected part was washed with warm water only.	10 (From 1-2-34 to 4-2-34 & again from 10-2-34 to 15-2-34)	20-2-34	Do

Case No. 2:—A Bhutia pony aged about 10 years.

Symptoms:—Almost as in case No. 1 with the difference that the sore was on the near fetlock and smaller in size. The duration of the disease was about 6 months. Unlike the previous cases it had no fibrous tumours.

Treatment:—Same as above but the symptoms of iodism appeared after 9 successive injections, when it was stopped for 10 days and then 8 more injections were needed to cure the animal.

Five more cases were treated successfully. In all these cases the treatment consisted of both intravenous injections and local dressing. My next cases were two ponies with Bursati sores on the inner canthus of the eye. These cases were treated with intravenous injections alone; the sores readily responding to the treatment. The animals were cured and discharged. This is a simple treatment for a disease that is always very slow to heal.

Annexed is a chart which will show the details of treatment. It is hoped that my colleagues will give a trial to this line of treatment, and communicate the result through this *journal* for the benefit of the profession.

NOTES ON CATTLE MORTALITY CAUSED BY DRINKING RUBBER LATEX.

BY

S. MOHAMED BABJEE, G.B.V.C.,

Veterinary Inspector, Kedah, Malaya.

In writing these observations and findings on the above subject, I would be very glad if any reader will suggest any remedy for the same. In my district, which is largely planted with rubber trees, I have come across several cattle drinking latex of rubber trees followed by sickness and death in about 90 per cent. of the cases, whether treated or not. It would appear that the seriousness of the case depended on the quantity taken, and the amount of acidity present in the stomach. A small quantity of the latex swallowed has invariably proved harmless.

The usual history of cases is that the animal had been out to graze the day previous and it gained access to a bucket containing the latex left there by the coolies, engaged in collecting latex, and drank the whole quantity.

Symptoms:—On the second day after the drink of latex the animal is noticed to be dull, off-feed, with a rise in temperature, and well developed tympanitis. It may pass a small quantity of semi-

fluid dung coated with latex, which is followed by complete stoppage of further defaecation and sometimes micturition. The animal stands in a state of stupefaction and on the 4th or 5th day, it does not move and dies of what appears to be intoxication, due probably to the absorption of poisonous gases formed by the abnormal retention of the ingesta in the alimentary tract, particularly the rumen and the other parts of the stomach.

Post-mortem examination usually reveals the rumen full of gas and ingesta packed very tightly with the solidified latex and the whole of its contents can be removed only with difficulty from the mucosa, it being very adherent. Similar conditions are noticed in the other compartments of the stomach. The small and the large intestines are sometimes empty or may at times contain long string-like pieces of solid but elastic rubber. The other organs are found to be normal.

Treatment:—The writer has treated two cases with apparent success.

Case 1:—A calf, aged three months, belonging to Mr. M. Kuala Muda Estate, was reported to have swallowed about 2 pints of latex on 21—5—34. It was brought for treatment on 24—5—34. On arrival, I noticed the calf to be very dull with a temperature of 102°F, and the abdomen very much distended with gas. It was given 8 ounces of Castor oil and 8 ounces of Tamarind Extract as kindly suggested by a planter friend, who had some success in treating a few such cases. This was followed by carminatives given twice daily. On 26—5—34, the owner reported that the animal was in the same condition and had not passed any faeces. A dose of Mag. Sulph. 10 ounces, fresh ginger juice 2 ounces, and Brown Sugar 1 lb was given in water as a drench in the morning and the animal passed in the evening some rubber coated dung which considerably relieved the animal. The Mag. Sulph etc., was repeated on 28—5—34, and the calf purged twice. On 6—8—34, the calf was found to be normal. The animal was again seen recently and it was found to be in poor condition.

Case 2:—Bull calf, aged one year and six months, belonging to Mr. P., who reported on 25—6—34, that it had swallowed about a bucketful of latex on 26—6—34. I noticed that the animal had the same symptoms as in the previous case but they were much more severe than in the other perhaps due to the larger dose of latex. The same line of treatment was followed. The animal passed faeces in strings and shreds coated and intermixed with rubber. The animal is still living and appears to be normal, but is losing condition.

Case 3:—Cow, aged three years, belonging to Mr. A, who reported that it had drunk about a bucketful of latex on 29—6—34,

On 30—6—34, he noticed his cow had tympany. For some reason or other no treatment was resorted to and no report was made until the animal died on 1—7—34. A post-mortem examination was done by me which revealed all the compartments of the stomach full of coagulated latex intermixed with the ingesta,—a regular impaction.

Case 4 :—Bull, aged two years, belonging to Mr. N, drank about a gallon of latex on 9—7—34. In this case, six days had elapsed before a report was made and since the animal was “in extremis” it was destroyed. The post-mortem examination in this case also showed an impaction of the rumen and other parts of the stomach with hardened latex and ingesta.

It would appear that death in such cases is due to impaction and intestinal intoxication.

I am indebted to Mr. J. J. Fleury, M.R.C.V.S., State Veterinary Surgeon for certain information in connection with the cause of death. It is said that the latex itself is not poisonous.

CASES OF AGALACTIA IN COWS.

BY

S. T. LACHIRAMANI, G.B.V.C.,

*Veterinary Assistant Surgeon, Civil Veterinary Dispensary,
Mehtar (Sind).*

Subject :—Red cow, ten years old, was brought to the Civil Veterinary Dispensary, Mehtar, for treatment on the 1st January, 1934.

History :—The cow was yielding two seers of milk when she was first purchased by the owner, when she had a calf at foot, two months old. The owner soon discovered that the yield of milk was gradually decreasing and ultimately stopped totally. Then the owner tried some crude methods such as gingering, punching of nose and twisting of ears and also used some country drugs, to no effect. At last he sought my advice and treatment.

Symptoms :—On examination I noticed the following symptoms. Condition fair, appetite almost normal, bowels constipated, udder shrunken and having no milk secretion and temperature normal.

Diagnosis :—I did not find any organic abnormality in the mammary glands.

Treatment :—First I gave her a laxative dose of Mag. Sulph. I then continued Mag. Sulph. 6 ozs. with Pot. Nitrates 4 drs. in drinking water daily. The udder was massaged with Catell's embrocation twice a day. With this simple treatment to the astonishment of the owner she began to give milk and went up to normal yield of two

seers morning and 2 seers in the evening, within about ten days after the commencement of the treatment.

I met with two similar cases some time later and they were also successfully treated with the same line of treatment.

ERRORS IN DIAGNOSIS.

BY

ABDUL MAJID N. SIDDIQI, G.P.V.C.,

*Veterinary Assistant Surgeon, Richmond Crawford Veterinary
Hospital, Karachi.*

“TO ERR IS HUMAN” is a well-known proverb, and a Veterinary Surgeon is no exception to it. In this brief note I wish to disclose some errors committed by some of us, with a view to draw lessons from such errors, so that we may be careful and more attentive in treating our patients.

1. A cow was brought to a Veterinary Hospital having a swelling of a considerable size on the lower jaw. It was diagnosed to be an abscess by mere manipulation and it was proposed to blister the part. On further examination of the case by opening the mouth of the cow, it was discovered that the cow had picked up a bone (head of femur of another cow or an ox) which firmly got stuck between the molar teeth and the cheek, the sharp edge of which was burrowing in the soft tissues and the smooth head of the femur resting on the cheek inside, thus making it to appear as a hard abscess or tumour externally. The bone was removed and the wound inside dressed antiseptically. When the bone was removed naturally the swelling disappeared.

2. A sporting dog, having run through bushes in a thick jungle, got a wound on its thigh. The wound was cleansed, sutured and treated for a long time, in the usual way at a Veterinary Dispensary with the result that it turned into a sinus, baffling all the efforts of the Veterinary Surgeon. The case was sent to another place, it was re-examined thoroughly, and it was found that a piece of rough wood about 4 inches in length and 3/8" in thickness was buried deep in the wound. This was removed and subsequently the wound yielded to the ordinary treatment in a short time.

3. A cow was treated for a wound in the eye for a very long time at a Veterinary Dispensary. The history of the case was that the eyeball was punctured by some sharp pointed instrument. A lot of purulent discharge was coming out from the wound and the eyelids were almost disfigured by myiasis. On inquiry the Veterinary

Surgeon assured the writer that the punctured eyeball had been enucleated completely. But when examined carefully, the suppurating portion of the eyeball was still in the socket. This portion of the eyeball was then removed and it healed up quickly.

4. A case of dumb rabies was once wrongly diagnosed to be a case of fracture of the lower jaw.

5. It is very common to make mistakes in detecting the real cause of lameness in horses. Facilities for examining hoofs of horses do not exist at many places and cases of corns are very often treated for shoulder lameness or any other thing the Veterinary Surgeon may fancy.

We should now consider as to why such mistakes occur and how best to avoid them. Usually they are either due to inattention or inexperience. Our patients do not speak and the owner or the person in charge of the animal may give either no history of the case or sometimes inadvertently omit the real cause. In such cases diagnosis becomes all the more difficult. It is therefore incumbent on us to examine every case thoroughly and attentively, refer to some literature and consult more experienced colleagues if need be. If the disease is correctly diagnosed and proper treatment is adopted, the result is bound to bring good both to the patient and to the Surgeon.

Hotch Potch for Veterinarians.

Blood counts:—Medical diagnosis is largely dependent, in obscure cases, upon proper pictures. Surgical diagnosis and the need of operative interference may often be determined by the hemogram. The total count is comparatively insignificant in importance, as compared to the differential picture. Gross mistakes have been made where the total count alone has been considered. The total count must be taken in conjunction with the differential count.—Gradwohl.

"All manifestations of disease are due to disequilibrium between the various colloid systems, brought about by some invader." J. E. R. McDonagh, F.R.C.S., London.

"North Amer. Vet. Dec. 1933."

Neosalvarsan in 4.5 gm. doses is a specific for equine influenza pectoralis. To be of any value it should be used within three days

of the outbreak. Percussion of the lungs is absolutely necessary for early diagnosis as Neosalvarsan is of no value after organic changes or secondary infection has taken place.

Neosalvarsan is of no value in the treatment of influenza catarrhalis nor of infectious broncho-pneumonia of horses. John A. Wende, D.V.M., New York.

Dr. Maxmilen Labedz in the Rec. de. Med. Vet. June 1933 says that the X-ray is the method of treatment of choice for interstitial keratitis in dogs. He states that the technique is quite simple, and that small doses of medium penetration repeated at two or three week intervals are of service in causing the resorption of corneal opacities—the cornea being quite insensible to X-ray used therapeutically. He theorizes that the use of X-rays is followed by favourable results probably because of the subsequent alkalization resulting from leucocytic infiltration.

North Amer. Vet. January, 1934.

Equine lymphangitis:—"Try colloidal iodine 50 c. c. to 1000 pounds weight. This has given good results and quickly. Adjunct treatment—Potassium Iodide, strychnine and digitalis."

North Amer. Vet. February, 1934.

'Bed Sores':—Attention is being revived in the use of 5 per cent. aqueous solutions of tannic acid in the treatment of pressure lesions resulting from decubitus. A virulent infection, profound necrosis of tissue and bone involvement are said to be contra-indications to the use of tannic acid in the treatment of decubitus. Dr. Earle O. Latimer of Chicago in the journal of the A. M. A. (March 10th 1934).

North Amer. Vet. April, 1934.

"Navel ill in foals":—250 c. c. of dam's blood given intravenously into the foal and immediately after drawing from the dam with a later dose following in one to three days.....The use of bacterins or vaccines is continued with the serum. Apparently they stimulate the body defenses.

North Amer. Vet. May, 1934.

"Water, certain salts and volatile agents in general are the only substances that are satisfactorily absorbed from the rectum. This means that, besides water, such salts as sodium chloride as well as

alkaloidal salts such as morphine sulphate or atropine sulphate and volatile agents such as ether or paraldehyde in oil, or alcohol or chloral in aqueous solution can be administered by the rectum with expectancy of therapeutic results. Quinine is too irritative to be tolerated in sufficient dosage by the rectum for adequate systematic action. It has been shown that dextrose and other nutrients are not sufficiently absorbed for practical purposes of nutrition; in other words, that "rectal feeding" is a delusion and a snare."

"Queries and Minor Notes":—Editor of the journal of the American Veterinary Medical Association, June 9, 1934.

Canine Distemper and Human influenza:—The virus of human influenza apparently induces an immunity in ferrets against the virus of canine distemper. The available data, as indicated in the preliminary report of Doctors Adolph Eichhorn and Norman J. Pyle suggest a possible relationship between influenza in man and distemper in dogs. Experiments are now in progress to determine the possibility of cross immunization with the virus of influenza and the virus of canine distemper."

Journal of Amer. Vet. Med. Assocn., June 23, 1934.

"Phenylmercuric Nitrate in Tinea and yeast infections of the skin in man and experimental animals:—

A most satisfactory preparation made of the drug is an ointment containing the phenylmercuric nitrate in a concentration of 1 in 1,500 by weight with the addition of 10 per cent. glycerine.

Benjamin Levine, M. D., writing in the J. A. M. A. (Dec. 30, 1933) advises the affected parts to be cleansed with soap and water and a soft brush and then anointed twice daily morning and night. The outstanding feature of the treatment was the relief from pruritis which followed one application of the ointment.....This drug is also indicated in parasitic skin diseases of horses and cattle, notably ring-worm."

North Amer. Vet. August, 1933.

"Blood transfusion, using the dam for the donor is a valuable treatment for any infection in the foal and J. N. Frost of Ithacca, New York says he gives all foals at birth 50 c.c. of the dam's blood, using a large syringe withdrawing blood from the jugular of the mare and inject into the jugular of the foal. In cases of navel disease however up to 500 c.c. should be given preferably hypodermically.....

Another treatment for the prevention of naval ill in foals and to cause the foal to be more vigorous is the administration of iodine to the mare during the later months of pregnancy. One 10 grain tablet of potassium iodide is dissolved in the drinking water once a week."

Veterinary Medicine, May, 1934.

"Experiments conducted on dogs infested with the heart worm, *Dirofilaria immitis*, indicate that Fouadin is a valuable drug in the treatment of infestations with this parasite. A suitable course of treatment with this drug results in the permanent disappearance of microfilariae from the peripheral circulation, in the sterilization of the female worms and in the eventual destruction of some or all of the adult worms in the heart and pulmonary artery.....Fouadin can be used intramuscularly or intravenously."

Veterinary Medicine, June, 1934.

Retaining a uterus after prolapse:—"The truss is conveniently made from two pieces of ordinary rope, one half inch in diameter and 12 to 15 feet long. Each rope is double in the centre and the two are united by a large loop in their middle, so as to leave an oval space somewhat in the form of a ring, which will surround the vulvar opening. The two ends of one cord are then passed downward between the hind legs on either side of the udder, and then forward and upward to meet and be tied together on the dorsal aspect of the neck in front of the withers from which point they extend downward on either side of the neck to form a collar. The ends of the other cord are carried upward on either side of the tail and tied together over the loins, then carried forward and downward to pass between the forelegs, and ventral to the sternum, are tied together and the ends passed upward and tied to the ends of the other cord constituting a collar. When so applied, the ropes exert a continuous pressure when the patient arches her back to strain, yet allow micturition defaecation without discomfort to the animal."

Veterinary Medicine, July, 1934.

In cattle in Louisiana, a type of Nasal Granuloma has been observed. The work of G. Dikmans, Bureau of Animal Industry, Washington, shows that he has found in the lesion a parasite which resembles *Rhinosporidium* in its general development.

N. A. V. September, 1934.

Undulant Fever:—Veterinarians are exposed to the disease in its most virulent form, probably more than any other group of people. While treating cattle and swine during the act of abortion or normal parturition they may be exposed to the organism in its most virulent state. An allergic reaction characterised by a smooth or papulo-vesicular erythema on that part of the arm which has been contaminated is common among Veterinarians. The reaction may recur at irregular intervals for months or years until the sensitization of the individual disappears. Operations on horses suffering with poll evil or fistulous withers are as likely to cause infection as is contact with the aborting cow, as many such horses have been found to be infected with *Brucella abortus*, or the more dangerous suit variety. The control and eradication of undulant fever in man is dependent entirely on the control and eradication of the disease in domestic animals.

N. A. V. September, 1934.

Rabies:—This disease affects all animals and is therefore of general interest to Veterinarians. But since the dog is the chief reservoir for the perpetuation of rabies, the dog is the animal which deserves first consideration in attempts at suppressing the disease. With canine infections at a minimum, very few people are bitten by dogs, and human rabies seldom occurs. General co operation in this matter would reduce the human death rate and lower the public expense. In man the incubation period varies from fourteen to ninety days according to the location and extent of the wounds. If the face and head are badly lacerated, symptoms may appear in a short time as ten days; if the wound is on an extremity and slight, symptoms may be delayed for weeks or months. Several cases of an incubation period of more than a year have been reported. Women show a shorter incubation period than men.

N. A. V. September, 1934.

Should Quinine be used to induce labour:—The action of quinine on uterine muscle in vitro cannot be considered to be identical with its action on the organ in situ. It seems to be agreed that quinine will not initiate labour, but can only be used to increase the force and frequency of contractions, and its value there is questionable. It is probable that this drug will best serve the veterinary practitioner if given after labour has been completed for stimulating uterine drainage.

N. A. V. September, 1934.

Manganese Deficiency as a factor in Bovine Sterility:—Collosol Manganese, in 10 c. c. doses given intramuscularly at weekly

intervals until no oestrus is observed for 6 weeks since service has been found to be effective in curing cases of Sterility in Bovines.

Veterinary Jour. Aug., 1934.

Undiagnosed Ailment of Sheep yields to Calcium:—Calcium Chloride solution (15 per cent.) in 15—30 c. c. given intra jugularly has been found to be effective in sheep suffering from indigestion. Tympany, etc.

Veterinary Medicine, Sept., 1934.

Induced Aestrum:—'Uden' Bayers is recommended for cases of weak heart, or irregularities in the course of aestrus cycle. The dosage for dogs is about 8 to 15 drops daily. Given as per as soon as the first symptom of heat appears and continued for about 6 to 12 days.

Veterinary Medicine, Sept., 1934.

Notes.

"To serve is my duty, nay my debt" says a Tamil Poet. We wonder if that is the source of inspiration or key-note of the life of Mr. A. Ramalinga Mudaliar. Recently he was on a tour of pilgrimage in Northern India with his wife in one of those Special Trains which run periodically. He utilises the opportunity to meet quite a number of our professional colleagues and discuss with them several plans for the better working of the All-India Veterinary Association.

He met the new Director of the Civil Veterinary Department, United Provinces, Mr. Egan, who received him very courteously and Mr. Mudaliar gave him an idea of the origin and ambition of the All-India Veterinary Association and requested him to consider the possibility of holding the next Conference at Lucknow in February, 1935. Mr. Egan promised to bestow his careful consideration to the proposal and we dare say there is every likelihood of the proposal materialising itself.

Again Mr. Mudaliar goes and unearths a retired Veterinary Surgeon leading a life of a recluse at Pandharpur and finds out that he has given an endowment of Rs. 20,000 to the Ferguson College, Poona; and Rs. 10,000 to Sir Parshuram Bhau College, Poona. The name of this gentleman is Dr. Dattatrya Sitaram Purohit. Mr. Mudaliar pleaded for similar endowment to any one of the

Veterinary Colleges in India, but the Doctor was in no mood to consider the proposal. Who knows, he may yet change his mind and see the validity of the claim of Dr. Mudaliar. We give below a newspaper extract about this doctor.

* * *

"Dr. Dattatrya Sitaram Purohit, a former Veterinary Surgeon of Sholapur, who is now in retirement at Pandharpur, has given Rs. 20,000 to the Ferguson College, Poona. He has also given Rs. 10,000 to the Sir Parshuram Bhau College, Poona.

* * *

Two more members of our profession have left this year for Edinburgh for higher Post-graduate Studies. They are Mr. N. R. Rajaratnam, G.M.V.C., for D. T. V. M. Studies from Madras, and Mr. R. C. Nathan, G.B.V.C., from Bombay. The thirst for higher studies is indeed a healthy sign of the progress of the profession in India.

* * *

The Advisory Board of the Imperial Council of Agricultural Research, sanctioned, at its meeting on the 3rd September, 1934, the grant for the appointment of a Research Officer and staff for investigation into contagious abortion in cattle, sheep and goats under the scheme from the Imperial Institute of Veterinary Research, Muktesar. The urgent need for this research work was rightly explained as some provinces, especially Madras and others have been suffering great losses on this account.

* * *

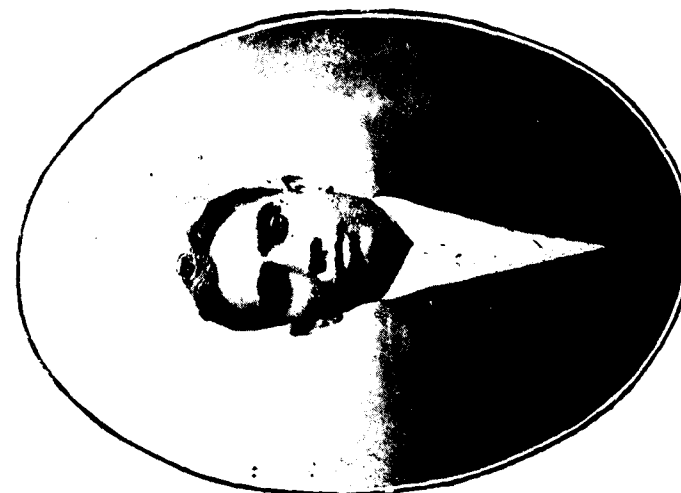
The same Board adopted, it is reported, the report of the Subcommittee on the annual reports of the Veterinary Investigation Officers of Madras, Bihar and Orissa and Hyderabad. We are eagerly looking forward for the publication of these reports for the information of the profession and the general public.

* * *

While adopting the above reports, the Associated Press of India says "the need was stressed for research in animal nutrition with the Central Institute to work in cooperation with the Imperial Institute Muktesar, to study the effects of nutritional defects on the incidence of disease among live-stock. It was pointed there is at present no Institute in the country dealing with this problem, although it is one to which attention was being paid in all other countries. It was essential that there should be cooperation between nutrition and Veterinary workers to deal with this most important live-stock problem of the country from the economic point of view." It is really hopeful that at least some of the important problems connected with the animal diseases are being brought for discussion at the meetings of the Board.



R. C. NATHAN, G.B.V.C.,
who has proceeded to Edinburgh
for Post Graduate Studies.



N. R. RAJARATNAM, G.M.V.C.,
who has proceeded to Edinburgh for
D.T.V.M. Course.

Communication.

ALL-INDIA VETERINARY ASSOCIATION.

TO THE EDITOR,

The Indian Veterinary Journal, Madras.

SIR,

On the expiry of my special duty in connection with the Rural Development Scheme at Trivellore in Chingleput District, I have come back on transfer to Anantapur and I have also shifted the headquarters of the All-India Veterinary Association to Anantapur. I, therefore, request all communications intended for the All-India Veterinary Association may be hereafter addressed to me at *Anantapur*.

Yours faithfully,

Anantapur, P. O.
(Madras Presidency)
30—9—1934.

M. S. SASTRY, G. B. V. C.,
VETERINARY SURGEON,
General Secretary, "The All-India
Veterinary Association."

TO THE EDITOR,

The Indian Veterinary Journal, Madras.

Dear Sir,

Please publish the following correction, in the current issue of your *Journal* and oblige.

In the proceedings of the Fourth Annual meeting of the Mysore Veterinary Medical Association published in the last issue of the *Journal*, among the members elected to the Managing Committee for the year 1934-35, the name of Mr. K. N. Srinivasan was omitted by inadvertance. May I request you to kindly rectify the error in the next issue of your *Journal* and express the Secretary's regret for the omission.

The Managing Committee is composed of the following :—

Mr. K. N. Srinivasan,
" S. D. Achar,
" K. Ranganatha Rao,
" K. R. Ramachandra Rao,
" P. U. Nayar,
" K. Srikantiah,
" M. Subba Rao.

As Mr. K. R. Ramachandra Rao did not wish to continue in the Committee, Mr. B. V. Venkatachar the next in the list of elected members, was nominated in his place.

Thanking you,

Yours sincerely,
P. U. NAYAR,

25—7—34 }
Bangalore City }

HON. SECRETARY AND TREASURER,
The Indian Veterinary Medical Association.

Extracts.

EQUINE ENCEPHALO-MYELITIS.*

CLINICAL OBSERVATIONS, TREATMENT AND EXPERIMENTS IN THE FIELD, ETC.

BY

MAJOR C. W. HEANE, R.A.V.C.

Clinical Observations.—At the outset it should be noted that the clinical picture presented and the degree of severity of attack in this outbreak were peculiarly varied, and ranged from cases which fell down in the lines completely paralysed, convulsively pawing the air and hanging their heads against the ground and causing severe bruising over the eye, to those which showed only the slightest inco-ordination of movement in the hind quarters.

In the large majority of cases, the first indication of anything wrong was shown by a marked dullness and depression, and in all except the mildest cases, off feed, and accompanied by a stiffness in gait of the hind limbs.

Temperature was seldom elevated on admission.

When the disease was definitely established, the inco-ordination and loss of power in the hind limbs became very apparent.

The hind toes were dragged at the walk and the tail nearly always elevated.

Inco-ordination was most noticeable when turning round, the animal appearing disinclined to turn on his hind quarters, and when doing so there was a marked sinking of the loins. This was the last of the symptoms to disappear in the process of recovery. Varying directly with the severity of the attack, partial or complete sensory paralysis in the hind limbs was shown, seldom or never extending sufficiently far forward so as to cause complete loss of sensation and control of the four limbs.

In some cases, partial paralysis of the fore limbs only was apparent—the horse crossing his legs at a walk and displaying exaggerated knee action, and in all cases of fore or hind paralysis, during movement the animal appeared to be feeling for the ground.

Hyperæsthesia was pronounced in the early stages of an attack and then appeared to pass off in one to two days. Dilation of the pupil and twitchings of the facial muscles were sometimes observed.

More constant symptoms were: pulse, sluggish and feeble; incontinence and, in severe cases, complete retention of urine. Faeces were also found to be retained, but without constipation. The heart-beat was invariably feebler than normal, but otherwise regular.

In geldings, the retractor muscles being involved in the paralysis, the penis would hang down out of the sheath. The lower lip was often paralysed and pendulous.

Urine at the commencement of an attack would be clear in appearance, but of a treacly consistence in severe cases, sometimes becoming muco-purulent and offensive in odour.

*The journal of the Royal Army Veterinary Corps. August 1934.

Two horses showed symptoms of hemiplegia, the neck being turned round to one side and able only to move round in a circle: one of these horses died and one recovered.

Other symptoms observed were swelling of both hind fetlocks and paralysis of the jaws.

One case only developed cranial symptoms which appeared in the nature of fits, with twitchings and contractions of the muscles of the neck, the head held down, and finally falling to the ground, unconscious and struggling. After ten to fifteen minutes, the horse would get up again and appear quite normal. This animal eventually recovered.

The large majority of fresh cases, as they were discovered, showed no apparent relationship to the previous ones by having been in contact with them in any way or at any time, and cases of actual incontacts developing the disease were rare.

In the last stages of the disease, twitchings of the abdominal or pectoral muscles generally supervened. Every case which collapsed totally in slings, unable to stand even with their support, proved fatal.

Prognosis and Mortality.—At the commencement of the outbreak from 17th to 24th November, before comprehensive routine treatment, slinging, etc., could be put into practice, the mortality worked out at 80 per cent.

From that time until the end of the outbreak in the following February, 26 per cent. of cases only were fatal. As a general rule those showing only slight symptoms when first noticed were fairly certain to recover under treatment.

In the case of those showing severe symptoms at the outset, which in this outbreak may safely be estimated at about two-thirds, prognosis is difficult.

From what I have seen the critical stage of the attack appears to be somewhere about twenty-four to thirty-six hours after the commencement of symptoms. It was found as a general rule that if the animal could be kept on his feet up to thirty-six hours by means of slings, in practically every case recovery followed. Once the animal had to be let out and was down, however, the condition rapidly became worse; but so long as the animal could stand on his fore legs and had the slings to support his hind legs and to preserve his balance after thirty-six hours, his chances of recovery stood high.

Treatment.—In all but the very mild cases, slinging was resorted to immediately on discovery.

The type of sling constructed for field use proved 100 per cent. effective, and while able to support the full weight of the animal's body it had the additional advantage over the orthodox hook-and-pulley sling that balance was much easier maintained by having complete support on either side as well as in front and behind.

The framework consisted merely of stout wooden posts about 6 ft. 6 in. high—the only detachable parts being a short post at the breast and one at the croup, which were roped on to the uprights.

The sling itself was made from good strong sacking. Four holes were made at each end through which the rope was threaded, and the holes stitched round with stout leather to prevent tearing of the material. A rope on each side was then passed through the rear hole and knotted—the free end passing over the top bar and down again through the next hole and so on, so that the sling could be tightened or loosened after the manner of a bootlace. Breast-plate and breeching, also of sacking, kept the sling in position and were fastened to the sling itself by

means of buckles. The standing was bricked and with the downward slope forwards, in order to take as much weight as possible off the hind part of the body.

Routine method of treatment which was carried out in all cases on admission and subsequently as a daily measure as far as was considered necessary :—

The animal was first placed in slings. In the early part of the outbreak blood-smears were taken and examined, all with negative results.

Twelve ounces of mag. sulph. were administered by stomach tube. The animal was given an enema. The catheter was passed in all cases, male and female, and the bladder invariably found full.

Towards the end of the outbreak, the effect of hexamine (urotropin) was being tried for its curative properties. Actually only the last six cases received this drug, but all were severely affected and all recovered. The dose given was 25 grammes daily in two ounces of water, intravenously over a period of four days.

Previous to this drug being taken, cases were being given subcutaneously, serum taken from the blood of convalescent and recovered cases in doses of 200 c. c. on admission and subsequently 100 c.c. daily. In the more severely affected cases this did not appear to have any appreciable benefit, but in all others recovery was definitely more rapid than otherwise was the case. In order not to confuse the issue, the administration was abandoned for the time being for the purpose of trying out the effect of hexamine.

From time to time the following agents were used in the treatment of this disease without any apparent benefit whatever :—

Strychnine, adrenalin, morphine, arecoline, calcium lactate, 2 drams intravenously, neganal, 4 grams intravenously, normal saline intravenously.

All cases, if they were able to walk at all, even with the assistance of four or five men to support the animal, were given forced exercise daily. The effect was very pronounced—after a few paces only, the improvement in gait was apparent and this form of treatment I believe to be of real and lasting benefit.

For this purpose also two blocks of four loose boxes were constructed from posts and planks only, in order to allow convalescent cases to exercise themselves.

Several horses that fell down in their own lines had to be brought to the sick lines with the aid of two bamboo poles, one pushed under the chest and one under the abdomen, and a party of men on each side were able to raise the animal on to his feet and, with the poles still under him, led forward slowly to the sick lines.

When the case was considered hopeless, destruction was carried out by means of chloroform to admit of the brain being removed intact.

The process of recovery took anything from three weeks to two months.

Post mortem Changes.—Naked-eye changes were very few, but fairly constant. There was always evidence of a mild gastroenteritis occurring in patches.

There was always present cystitis of varying intensity with thickening of the bladder wall. The spleen was found sometimes to be considerably enlarged. Vessels of the cortex of the brain invariably showed some congestion.

Experiments and General Observations in the Field.—The disease appears to attack all classes of horses, irrespective of breed, age or sex.

During the period in which the disease was confined to "H. Q." Squadron, on the recommendation of Major G. A. Kelly, R.A.V.C., D.A.D.V.S., Lahore District it was decided to test the properties of serum taken from the convalescent and recovered cases, in a prophylactic and curative sense.

The serum was prepared as follows :—

About one litre of blood was drawn off from the jugular vein into a sterile flask and the blood allowed to clot and the serum to be expressed in the normal way, each litre of blood yielding about 350 to 400 c.c. of serum. After twenty-four hours the serum was drawn off, and to every 100 c. c. were added 10 c. c. of a 5-per-cent. solution of phenol.

As an experiment, half the horses of "H. Q." Squadron—approximately fifty—were given 100 c. c. of this serum in an attempt to confer on them passive immunity. The result unfortunately could not be considered in any way conclusive, as from the time these inoculations were carried out no further cases occurred throughout the whole squadron, with the exception of one which had received serum forty-eight hours previously and which was undoubtedly well advanced in the incubative stage.

At one period, the possibility of an excess of baru grass (*serghum halepense*) in the hay, said to have a cyanogenetic action, being in some way responsible for the disease was considered, and it was decided as a test to feed this grass only to one selected horse.

The grass farm at Multan collected about 60 lb. of baru for this purpose. However, the effect it had on the animal appeared to be nil.

Food deficiency as a contributory factor in the cause of the disease was also thought to be a possibility.

By the orders of the D. D. V. S., Northern Command, a supply of mineral feeding flour and pot. iodide was arranged for, and was given daily to all horses in "H. Q." Squadron, two ounces of the flour daily being mixed in each midday feed. This was commenced on 25th January, but subsequent to it being put into operation there were no further cases in this squadron—the last case having occurred on 18th January—and in consequence this experiment was not proceeded with farther.

The period of incubation and method of natural infection are not definitely known, but the fact that on one occasion after "A" Squadron had been clear of the disease for nearly six weeks and fourteen days in isolation, three fresh cases appeared in the squadron at precisely the same time, not in contact with one another in any way, seems to indicate that the period of incubation, whatever it may be, is constant, and to the possibility that it is spread by some common transmitting agent, such as the biting fly or mosquito. The way in which fresh cases appeared usually having no apparent relationship with any previous ones would also tend to support this supposition of the means of spread.

Two attempts were made in the lines to pass on the disease from one animal to another :—

(1) By removal of spinal fluid taken from a horse in the acute stage of the attack and inoculating into the spinal canal of a healthy animal.

About 2 c. c. of spinal fluid were removed by means of an intrathecal needle, from a case in slings at the time. An experimental horse was then thrown by means of side lines and the 2 c. c. of spinal fluid injected intrathecally. This failed to set up the disease.

(2) Another experimental horse was placed alongside a recent acute case in slings and watered from the same bucket. Saliva was also transferred at intervals to the healthy horse's mouth and grass given contaminated by urine from the affected case. This also failed to communicate the disease.

In two cases, acting on the supposition that possibly an increased production of cerebro-spinal fluid might account for the disturbance of co-ordination, I removed with an intrathecal needle 50 to 60 c. c. of spinal fluid in each case, but without effect.

On 2nd February systematic taking of evening temperatures of all horses in the regiment was initiated on the recommendation of the D. V. S. in India. As a result, an interesting feature in the nature of the disease came to light.

It revealed that in a certain percentage of cases, and possibly in all, the symptoms of paresis are preceded by a preliminary phase of pyrexia lasting from two to four days, followed by a return to normal one to two days before the onset or actual symptoms of paralysis.

Soon after temperature-taking commenced, cases of fever occurred at irregular intervals amongst the horses of "A" Squadron only. Altogether ten horses showed temperatures varying from 102 to 106. As each case of fever was discovered it was isolated. Of these ten cases, six subsequently developed encephalomyelitis in the manner described. It would seem probable that the other four were infected, but not sufficiently severely to set up clinical disturbance.

These were the last cases to occur in the regiment.

The fever was not accompanied by any systemic disturbance whatever and the only abnormality noticed was some injection of the conjunctival mucous membranes, and in all cases which developed the disease, swelling of both hind fetlocks.

Blood-smears from all these cases were examined daily, with negative results.

Had cases continued and this preliminary fever found to be a constant factor, the method of control would have been very much simplified. Again, had further cases occurred, it was intended for the purpose of definitely determining whether or not serum had any protective value to regard any rise of temperature as a premonitory symptom of the disease, and give each one 200 c.c. of serum either subcutaneously or intravenously.

It is just possible that the virus may be present in the blood-stream only during this febrile period, and thus making the animal infective to others only at this time, which might account for the difficulty of infecting a healthy animal from a diseased one by experimental methods.

It was unfortunate from the investigation viewpoint, that the outbreak ceased just at a time when the clinical study of the disease had reached an interesting stage.

Local conditions of climate and humidity may have some influence on the activity of the virus, and cold and dampness would appear to enhance its virulence. More cases occurred during the really cold weather and when there was dew than at other times. The very large majority of cases were discovered in the early mornings. The disappearance of the disease coincided with the beginning of warmer weather.

The question of whether or not immunity is developed is interesting. It is not determined, but the fact that all cases which did not end fatally to all appearances recovered completely and that none have shown any sign of relapse seems to lend weight to the supposition that immunity is set up and that in consequence the serum has some clinical value.

The possibility of recovered cases being "carriers" cannot be ignored.

PATHOLOGICAL INVESTIGATION.

BY

PROFESSOR J. E. SHIRLAW,
Punjab Veterinary College, Lahore.

In a previous report, the writer mentioned the initial steps which had been taken to make an attempt to arrive at a diagnosis, and since this report was submitted on 15th December last he is in a position to give some very accurate information concerning the essential nature of the disease and an account of the various steps that have been taken to establish a diagnosis.

Throughout the course of this outbreak the writer has regularly received such pathological tissues as he considered necessary, and a detailed *post-mortem* account of every horse that either died or was destroyed in extremis.

It was decided, as an initial step, to obtain the most accurate information possible concerning the *post-mortem* appearances, and, secondly, the essential tissue changes occurring throughout the organs.

The disease appears as a specific meningo-encephalitis of the horse. This disease, or a disease of a similar nature, has been described in many countries: and on a review of the literature pertaining to meningo-encephalitis of the horse, the outbreak which occurred in the horses of the regiment bears a very striking similarity, especially to those outbreaks recorded in America, in which country serious epidemics of the disease have occurred. It is only in the last decade that any attempt has been made in America to elucidate essential pathology of this disease. Previously, it had been considered as in some way associated with the feeding of the horses.

In Europe generally, and in Germany especially, a similar disease has been known for many years, for at least a century—so-called enzootic cerebro-spinal meningitis or "borna disease." This disease is enzootic in areas, tending to assume epizootic characters, and in such infected areas cyclic incidence occurs at intervals of every few years. The incidence seems controlled to some extent by climatic factors. The disease appears infectious, although one of its most striking peculiarities is that it does not spread in the same way as infectious diseases usually do. During the course of an outbreak, animals may become infected in batches, and when breaking out on a horse-breeding farm may occur only on one part of the farm. In certain outbreaks only one or two animals may sporadically be affected, and the disease tends to spontaneously disappear without any further spread, while in other outbreaks the disease may sweep through the horses, assuming the proportions of a veritable epidemic with a high rate of mortality. In American outbreaks, mortality averages about 40 per cent. and may be much higher.

It appears that, in the horse, there is more than one type of meningo-encephalo-myelitis, the most important and the most specific being "borna disease," which was first noted in Germany many years ago. In recent years, the amount of literature published on this disease is extensive, and workers in this disease may be divided into three schools, German, French and American, although in other countries there are copious records of investigation.

The workers in France have described a disease practically identical with "borna disease," but differing from it in certain important characters.

It has been definitely proved that "borna disease" is due to a neurotropic virus which possesses a close affinity to the viruses of visicular stomatitis of the

horse, louping ill of sheep, and epidemic poliomyelitis of the human subject. The virus is pathogenic for cattle, rabbits, guinea pigs, rodents and monkeys, while cases are on record where a man has been accidentally infected. It seems difficult to experimentally infect horses with the virus, and German workers mostly incline to the opinion that this cannot be directly done. In other countries a successful direct transmission of the disease from horse to horse has been effected.

The disease in America is analogous to the French form of the disease described by Moussu-Marchand. German workers maintain that the Moussu-Marchand form is quite distinct from their conception of 'borna disease,' although French workers do not accept this opinion. The trend of thought would seem to indicate that the virus producing meningo-encephalitis of the horse may exist in an organotropic form as well as a neurotropic, and, accepting this possibility, a ready explanation can be found for the lesions which occur in the Moussu-Marchand type of the disease. These lesions consist essentially of:—

- (1) Degeneration of the parenchymatous organs along with haemorrhages. Haemorrhages also occur in the brain and spinal cord.
- (2) Joest-Degen bodies are absent.
- (3) The nerve cells of the brain and spinal cord show definite degenerative changes.
- (4) It is found difficult to experimentally transmit the disease to rabbits on intra-cerebral inoculation, if not impossible in the majority of cases.

These differences appear, on a wide review of literature, to be more of degree than of kind. Many workers mention haemorrhages in "borna disease," as well as infiltration and destruction of nerve cells.

Apart from the acceptance of Joest-Degen bodies as being an essentially typical feature of "borna disease," it appears difficult to accept any definite set of *post-mortem* lesions as being typical.

During the course of one outbreak, haemorrhages in the brain, spinal cord and parenchymatous organs may be present or absent. The absence of any *post-mortem* lesions at all is, in some cases, the most striking feature of the disease. The lesions in the brain and spinal cord are constant in the majority of the cases, but variations may occur. Infiltrations may be extensive around the capillaries, or absent, in which case the brain substance shows a diffuse mononuclear infiltration. The one definite and invariable lesion seems to be a slight thickening of the meninges, without exudation, and those changes described in the blood vessels. In chronic cases there is a formation of new tissue in the meninges.

Referring again to Huttyra and Marek, there exists a form of enzootic spinal paralysis of the horse, which is characterized by multiple capillary haemorrhages in the various organs, and especially in the spinal cord. It is stated that this disease is caused by streptococci, but in a footnote some considerable doubt is cast on such an etiology, and the question concerning the possible relationship between this disease and "borna disease" is raised. If we combine the *post-mortem* pictures of these two diseases as described by Huttyra and Marek, we get an average and accurate picture of the disease which we have been investigating at Multan.

Other disease possibilities have not been overlooked, and the following observations may be made:—

1. *Forage Poisoning.*—The most up-to-date information regarding forage poisoning in the horse is published and reviewed by Steyn, Dy.G., in the *Orderst-poort Journal* of July, 1933. There is an essential dissimilarity of symptomatology between forage poisoning and the disease encountered at Multan, as well as in the lesions of the disease which it is not proposed to discuss here. This dissimilarity is enhanced by the fact that experimental feeding transmissions failed both in horses and in small animals, and, furthermore, disease at Multan was not affected in any way by withholding the suspected forage for a period. In typical forage poisoning, symptoms of meningitis, if they do occur, are not predominant, and in the few definitely diagnosed outbreaks of forage poisoning on record the feeding of the suspected fodder or silage to experimental horses succeeded in reproducing the disease in a typical form in the majority of cases. Many outbreaks of so-called forage poisoning are actually outbreaks of botulism.

The possibility of botulism has been considered. Here again the symptomatology of pure experimental botulism in the horse is quite different from that seen in equine encephalo-myelitis. Symptoms of lethargy, loss of co-ordination resulting in a staggering gait, hyperæsthesia and muscular twitchings with general symptoms of meningitis are not seen in botulism. Paralysis of the tongue, a constant feature of experimental botulism, is never observed in equine encephalo-myelitis. Nor are tissue haemorrhages or perivascular infiltrations seen in botulism.

The evidence that the outbreak of the disease in the horses of the regiment is related to, if not actually identical with, specific enzootic equine encephalo-myelitis as occurring in other countries may be summarized as follows:—

In all cases of the disease, there is a definite meningo-encephalitis of a disseminating, infiltrative, non-purulent, lymphocytic type with predominating vascular character. The lesions in the nervous system and the general *post-mortem* features are on a summation of *post-mortem* protocols, as follows:—

Subacute inflammation of the vessels of the meninges without any exudation, accompanied by perivascular infiltration and frequent haemorrhage. Punctate haemorrhages are frequent in the brain substance, and a typical diffuse mononuclear infiltration of the neuroglia with destruction of the nerve elements is seen.

Similar lesions are present in the spinal cord. Joest-Degen bodies are not found. Haemorrhages occur throughout the parenchymatous organs in the majority of cases, and there may be slight degeneration of the cells of these organs. The lymph glands are occasionally swollen and haemorrhagic. Gastro-intestinal catarrh is noted in a few cases. The bladder contains a thick syrupy urine which is frequently blood-tinged, while the submucosa is studded with haemorrhages. Secondary infection of the bladder consequent on urinary stasis is not uncommon, the end result being, in protracted cases, a thickening of the wall of the bladder by a slow infiltration of granulosomatous tissue.

The *post-mortem* appearances presented are parallel to those encountered in American outbreaks caused, probably, by a virus of the Moussu-Marchand type.

The symptomatology of the disease is, on all essential criteria, identical. Recovered cases, in American outbreaks, tend to a permanent disability expressed in terms of altered nervous function and structure. In the one recovered case which was examined there appeared no clinical disability. Definite proliferative

lesions were found in the meninges, which were thickened and adherent, as well as in the nerve cells of the brain and spinal cord. Hæmorrhages were persistent in the ependyme, the cerebral cortex, and the internal organs, especially the kidney.

A further point of analogy is that, in the Moussu-Marchand type of the disease there is a definite prefebrile phase of about four days duration. A similar fact was noted during the outbreak at Multan.

Opinions differ very much as to whether any drug treatment is of avail. In German outbreaks, considerable faith is placed in the intravenous injection of urotropine in large daily dosage. This drug is excreted by the choroid plexus, and its use appears rational. It was used with a considerable measure of success in the outbreak at Multan.

The disease shows a cyclic incidence.

Further evidence is adduced by the transmission experiments which were attempted, while it is true that rabbits could not be infected by intracerebral inoculation of nerve tissue obtained from diseased horses—several guinea-pigs died after similar inoculations, without, however, any symptoms of the disease in question. (The nerve tissue of these cases has not yet been examined.) This finding corresponds with that of workers in America, who failed, in the majority of cases, to reproduce the disease in rabbits, and found that guinea pigs were more suitable for experimental inoculations, although these animals showed no typical symptoms of the disease, apart from lesions in the brain after death.

It has lately been found that rabbits can be infected by intraocular injection of filtered brain emulsion, and using the same route, horses can be infected, although not constantly.

The French virus has only rarely succeeded in transmitting the disease when inoculated subdurally in horses, but that it is capable of doing so has been adequately proved.

This fact agrees with our transmission experiments in which we inoculated two horses with brain emulsion from a case of the disease, one subdurally and the other into the temporal plexus, with the subsequent development of diseased symptoms of a type strictly comparable to the original disease. These symptoms could not be ascribed to errors in technique, as a definite incubation period of nineteen days elapsed before the onset of symptoms. In experimental transmission of the disease to horses in other countries, an incubation period of similar duration has been noted.

Our successful result in producing the disease in a horse by the intrathecal inoculation of cerebro-spinal fluid is also in accordance with the experience of two German workers.

Lastly, although the limited time at our disposal prevented our undertaking any filtration experiments, there is a strong presumption that the disease is of virus origin, an opinion that is strengthened by the fact that no bacteria could be shown, in the few cases when they were isolated from the disease, to possess an etiological role.

I am of opinion that the disease occurring in the horses of the regiment at Multan is a specific equine meningo-encephalitis, probably caused by a neurotropic filterable virus of organotropic type.

EXTRACT FROM THE ANNUAL REPORT OF THE IMPERIAL INSTITUTE OF VETERINARY RESEARCH, MUKTESAR FOR THE YEAR ENDING 31ST MARCH 1933.

We reproduce a few extracts from the report of the Pathology section of the Institute by Captain S. C. A. Dutta, Veterinary Research Officer, since the subjects dealt with are likely to be of considerable interest in the development and progress of veterinary research in this country.

I. Non-Sweating in horses.

Pieces of skin from half a dozen horses affected with non-sweating, on histological examination, revealed varying degrees of atrophy of the sweat glands and fibrosis of the blood vessels supplying these glands. Of these cases, the thyroid gland from one case only showed an abnormality, consisting of a distinct congestion and increase of fibrous connective tissue. An attempt was made to confirm the work on "Dry Coat", as it is called in Malaya, recorded by Tull and Wright in the Veterinary Journal of 1925, but contrary to their findings, no micro-organism could be isolated by cultural methods from samples of blood collected from two clinical cases at Muttra.

II. Equine Paraplegia.

An outbreak of paraplegia was reported amongst some fillies at the Army Remount Depot at Sargodha in the Punjab and this provided another opportunity for investigating this interesting condition at this Institute. The disease was restricted to one set of paddocks, situated in the centre of the depot, notwithstanding the fact that movement of animals from this to other paddocks had been taking place previously and the source of the forage and water supply was the same for the whole depot. There were 357 mules and 166 fillies in these paddocks. The ages of the animals varied from 2½ to 4 years and most of them had been in the depot for periods varying from 1 to 2½ years. It is not clear why no cases occurred among fillies of the same ages in other parts of the depot.

Nineteen cases occurred during the outbreak and they ranged from mild to severe, the only clinical symptoms discernible in a number of cases being varying degrees of incoordination of the hind quarters. In both the acute and mild cases, the temperature usually remained normal, hyperpyrexia setting in rapidly in acute cases a few hours prior to death. In the earlier stages, the affected animals look bright and feed well but some dribbling of urine is seen in all cases. The late rise of temperature before death probably indicates complications. Of the 19 animals concerned, 12 were of the mild type, and 7 of the severe type. One of the acute cases was kept up on its legs by improvised slings and it is noteworthy that this animal continued in this state for about 70 days without any further developments until it was destroyed. The beneficial results of slings in this condition were recorded by Poyser in 1885. Although in the earlier stages, the disease appeared to be purely a spinal affection, there is little doubt that in at least the acute cases the brain is also affected, for varying periods of excitement and coma were seen.

Judging from the records, the occurrence of this condition has been noted on many occasions since about 1872 in several places in India, and sometimes at least it seems to have been confused with Kumri. Actual enzootics of Kumri have also been described from time to time, and in future it will be necessary to

distinguish carefully between the two conditions, if this is possible, but there is, of course, the possibility that these conditions are merely different manifestations of one and the same infection.

At present however the evidence is that they are different the most striking difference being the more sudden onset and the septicaemic condition of the carcase as has been observed in the course of two autopsies, resembling cases of *Enzootic Encephalo-mylitis* or *Borna disease* described in Fance *Moussu* and *Marchand* in 1924.

As on previous occasions, laboratory examination of various material from these cases, as also attempted at experimental transmission by feeding, and inoculation through different routes into both small animals and horses failed to produce any significant results. There was no evidence of any anaerobic infection in any of the material examined.

III. Fatty Degeneration of the Liver in Pregnant Donkeys.

Sections from two cases at the Army Remount Depot, Mona, were studied. This condition appears to be very similar to the condition known as "Pregnancy disease in ewes."

Reviews.

R. Von Ostertag's Text Book of Meat Inspection.—Text-book of Meat Inspection. R. Von Ostertag. Translated by C. F. Marshall. English Edition, edited by T. D. Young, O.B.E., M.R.C.V.S., D.V.S.M., F.R.S.I. Pp. xl to 743. Coloured Plates, 10; Figs. 247. Price 45s. Published by Messrs. Bailliere, Tindal & Cox, 7-8, Henrietta Street, London.

As the editor of the book says, "this is an entirely new book superseding and replacing, as the author points out in his preface, that classic Ostertag's Handbook of Meat Inspection, which for so many years has been the guide, counsellor and friend of those responsible for the inspection of meat and meat products and has rightly been regarded as the standard book of reference in every part of the English speaking world". The book contains highly valuable information both on Ante-mortem and Post-mortem examination of food animals, enhanced by the addition of a chapter on poultry diseases. Diseases caused by animal and vegetable parasites naturally occupy a good portion of the book, while in the chapter on emergency slaughter and meat poisoning, the author gives a delightful survey of the para-typhoid question and its bearing on meat inspection. The book "contains all that is necessary for the student and practical Veterinary Surgeon to know on the subject of cattle and meat inspection and Veterinary Science and, in our opinion, no Veterinary Surgeon should be without a copy of the book in his library.—R. S.

Annual Report of the C. V. D., United Provinces, for 1933-34.—For the first four months, late Capt. S. G. M. Hickey was the Director and for the remaining eight months Khan Bahadur N. Mohamad was the Director. Cattle epidemics were almost as severe in the year under review as in the previous year, the reported mortality during the year being 54,450 as against 55,110 in the previous year. Rinderpest claimed 40,450 deaths; Foot and Mouth 1086;

Haemorrhagic Septicaemia 8,270; Black Quarter 576, Anthrax 924 and other contagious diseases such as Cow-pox-Pleuro-pneumonia etc., claimed 670 deaths. There were two cases of Glanders one of Anthrax, 113 of Surra and 72 deaths from other contagious diseases such as Piroplasmosis, Tetanus, Strangles, etc. among equines.

2286 other animals died from contagious diseases such as Rabies, Distemper Piroplasmosis, Fowl-cholera and other parasitic diseases.

184,051 inoculations by serum alone method were carried against Rinderpest as against 177,594 in the previous year. Only 180 inoculations by S. S. method were done against Rinderpest including 97 done in an actual outbreak. When many provinces even in India have far advanced in the large number of S. S. inoculations as against serum alone method, it is not known why there should be such a slow progress in this direction in an otherwise progressive U. P. On the other hand, it is satisfactory to note that Goat-virus alone method of inoculation against Rinderpest among bovines has been done in 8101 cases including 289 done in an actual outbreak. There was only one mortality in the latter case, the total deaths being 15 only, out of 8101 thus inoculated.

There has been a steady increase in the total number of cases treated and castrations performed both in the hospitals and by the touring staff. Only two new dispensaries were added during the year to the list, the total number of Veterinary Hospitals and Dispensaries being 173 at the end of the year. Six new Veterinary Surgeons were employed during the year and Mr. H. B. Shahi, M. Sc. M. R. C. V. S., D. T. V. M., who was a United Provinces Government scholar for Veterinary Education abroad was appointed to the temporary post of Veterinary Investigation Officer in the five year scheme of the Imperial Council of Agricultural Research from the 4th April 1933. After completing his six months training at the Imperial Institute of Veterinary Research, Muktesar, he conducted tests in Tuberculosis and Johne's Disease and carried out goat-virus alone method of inoculation against Rinderpest, first as an experimental measure and then on mass scale. He also made a general survey of contagious abortion, bisi poison and several other obscure diseases.

Observations during the course of goat-virus inoculation of cattle "presented varying results. The adult stock of the villages (both cows and buffaloes) registered a definite reaction but in the farms there was only slightly appreciable reaction and in the majority of cases it was absent. Young stock takes the virus well. Reactions presented by them under village conditions were more marked and in some cases severe". The results so far obtained in the experimental works carried out in the three laboratories of Lucknow, Agra and Allahabad are also recorded in the report.

The Department has been also in charge of the breeding operations in the province and an all-round improvement is noticeable under this head also. The Department has also shown keen interest in the fairs and shows of Cattle, Horses, Dogs and Poultry. Veterinary Exhibits were displayed at some of the Shows and Exhibitions. The report says "Propaganda work in a modest form with the very limited resources of the Department was undertaken." Modesty is really a virtue under normal circumstances, but with the Veterinary profession and Departments in India, it has been a vice. What is required is a teaming and raging propaganda to wake the people and the powers that be up to the sense of responsibility and to save the country from the heavy economic loss due to the preventable diseases.

It is good that the subordinate staff delivered a large number (358) of lectures on varied subjects relating to the proper feed and up-keep of cattle, first aid, preventive inoculations, castration, common contagious diseases, animal husbandry, etc., in different vernacular schools of the province. Both the provincial and subordinate officers should now carry on this kind of useful work further to the higher educational institutions such as Arts and Science Colleges. It is hoped that this good example of the United Provinces will be beneficially followed by the staff in the other provinces and States in this country.

On the whole, the report is a record of a good year's work and we are told all this good work was done at a total cost of over 4,14,917-11-0, the net cost being 2,88,536-10-0 only to the State. Our hearty congratulations to Khan Bahadur Niaz Mohamad Sahib Bahadur and his loyal staff.—M. S.

Annual Report of the Stud and Veterinary Department of H.E.H. The Nizam's Government, Hyderabad (Deccan), for the year 1931-32 (Fasli 1351):—Throughout this period Capt. Nawab Rais Jung Bahadur was the Director of the Department in these dominions. The events recorded in this report and to be reviewed are now nearly two years old and as such they would lack the freshness of the recent events. In the meanwhile the State has also advanced considerably in Veterinary matters. It is gratifying to see that the breeding operations among all cattle, horses and other animals are in the hands of the Veterinary Department in this biggest Indian State and the Department rightly takes a great interest in these useful operations. The Amrut Mahal bulls were purchased from the Ajjampur Cattle Breeding Depot, Mysore State, and distributed among the breeders in the Dominions with a view to improve the local breeds of cattle as an experimental measure.

Contagious Diseases among cattle claimed greater number of deaths during the year than in the previous one, Rinderpest and Haemorrhagic Septicaemia being more severe than the other diseases. Rinderpest was said to be on the rise during the year. Temporary staff had been appointed to cope with the increased number of outbreaks of Rinderpest and other diseases. Still due to want of funds inoculation work had to be curtailed in one district and it could not be started at all in another district. It is a great pity that want of funds should stand in the way of saving the poor agriculturists from the heavy economic loss of his livestock in the Dominions of even the richest Ruler in the country. Total number of preventive inoculation rose to 1,44,722 during the year from 94,304 in the previous year. Sero-virus inoculations against Rinderpest was done in a large number of cases as the Government had sanctioned about Rs. 50,000 for this purpose. Mr. Ramachandra Mudaliar was mainly responsible in doing a large number of these inoculations. Owing to this heavy and propaganda work he did, his health broke down and soon he retired. As our readers are aware this Officer did not live long to enjoy his hard earned pension. But the work he started is progressing well.

Several useful tables are given in the report detailing information on important branches of work. We would venture to suggest that these tables may be modelled on those found in the similar reports in the British India, for easy reference and uniformity. During the year these were 18 State Scholars undergoing training in the five Indian Veterinary Colleges, and one Scholar in the Royal Veterinary College, London. Besides these, there were two officers undergoing Post-graduate course in the new Patna Veterinary College. The Imperial Council of Agricultural Research has sanctioned an appointment of a Veterinary

Investigation officer in these Dominions on a five year plan and Mr. M. R. Mahajan, M.R.C.V.S., was appointed during the year for this post and deputed for the usual six months training to the Imperial Institute of Veterinary Research, Muktesar. In the Subordinate service, there were a number of vacancies during the year, e.g. one of Veterinary Inspector, one of Veterinary Assistant Surgeon and 6 of Veterinary Assistants remained vacant out of the subordinate strength.

The Report tells us that a reorganization scheme of the Department has been submitted and it was under the consideration of the Government. Both the Government and the Department duly acknowledge the help from the Imperial Council of Agricultural Research, Imperial Institute of Veterinary Research at Muktesar and the Mysore and Madras Serum Institutes for the supply of several serums and vaccines as this premier Indian State has not yet got a Serum Institute of its own.

The several Horse and Cattle Fairs have received due encouragement from the Department. Many prizes in money, bangles and medals (Gold and Silver) have been awarded in these fairs and shows.

There has been a steady increase in the number of inoculations done, cases treated both at the hospitals and on tours and castrations performed. The Government review on the report rightly records the progress of the Department in every respect.—M. S.

Annual Report of the Mysore Serum Institute, Bangalore for the year 1932-33.—It gives us much pleasure to review the report of this infant institution on its solid work in the fifth year of its useful and important life. This institute started on a temporary and experimental basis in 1927, soon earned its title for permanent existence in the economy of the State and thus it was made permanent during the year under report, with Mr. S. D. Achar, G.B.V.C., as its head under the new designation of "Superintendent," instead of the old title of "Officer-in-charge". Our readers may remember that the primary object with which this institute was started was to manufacture Anti-Rinderpest Serum and Rinderpest Virus, required for the extensive sero-virus inoculation campaign in the State. We are glad to find that the Institute not only did fulfil this important object admirably well but it soon began to supply its surplus stock of anti-serum and virus to Hyderabad, Baroda, Cochin and Coorg. The Institute under the able management of its present Superintendent soon developed its activities in many useful and legitimate directions.

We have heard many times from Dr. L. C. Coleman, the then Director of Agriculture in Mysore who was mainly responsible in conjunction with Major R. W. Simpson, the then Superintendent of Mysore Civil Veterinary Department to bring it into existence, that it was their ambition to enlarge the usefulness of this institute both with manufacture of several sera, vaccines and other biological products and in its research work also. Dr. Coleman had the good fortune of seeing this development to a large extent before he left the State on retirement. To-day this Institute is a great centre of many activities and it promises to grow into a very important centre of Veterinary Science for research and manufacture of Sera and vaccines. The decline during the year, in the number of Rinderpest outbreaks in the state and consequent decrease in the demand for Anti-Rinderpest Serum, gave the Institute the necessary stimulus and time to undertake successfully the manufacture on a large scale of several kinds of sera and vaccines, such as H. S. Serum and Vaccine, B. Q. Serum, filtrate and Bacterin, Anthrax Serum, Sheep-pox vaccine and Rinderpest Goat-virus. In

addition, experiments with satisfactory results were conducted in producing "fixed" Rinderpest goat-virus for immunising cattle against Rinderpest. Tests were also conducted to find out the period of immunity resulting from the inoculation of such virus and to find out the viability of goat virus if kept in cold storage. Further tests were being conducted in these and several other directions at the end of the year. The Institute also conducted field experiments in Goat-virus alone inoculation against Rinderpest among Amrit Mahal Cattle, sero-filtrate method of inoculation against Black-quarter in different forms.

The laboratory in the Institute also examined many smears and specimens received for report from the staff of State Civil Veterinary Department. The Institute also collected and classified many helminths. A Burmese student from the Bengal Veterinary College underwent training in the Institute during the year. The Institute has become rightly a place of scientific and general interest attracting many eminent visitors including Scientists, Administrators, public leaders and students. In spite of reduction in the sale price of different sera and vaccines effected during the year, the Institute we are told worked at a considerable profit. The Institute took part in the Dasara and other Exhibitions held in the State and got a gold medal certificate for its products.

The Superintendent and his staff have all worked with the sole object of making the Institute a very useful and important centre of Veterinary Science in the State. The work in this Institute only shows what the Indian talent and administration can usefully achieve, if left free.

Mr. Achar and his staff have justly earned the appreciation of the Director and the Government for the solid progress made in the Institute.—M.S.

Annual Report of the Live-Stock Section of the Mysore Government, for the year 1932-33.—Lieutenant A. A. Monteiro, G.B.V.C., was the Live-stock Expert in charge of the section throughout the year. This was formerly known as the historic Amrit Mahal Department, since the famous Amrit Mahal cattle were the only live-stock which then came under this section since its reorganisation and the subsequent administration by the Veterinary Officers, the section has under its control both cattle and sheep breeding operations in the State.

Seasonal conditions during the year were more or less favourable to provide adequate grazing and water throughout all the kavals except in one in Nagamangala Taluq where a temporary well was sunk for the supply of water. There were no serious outbreaks of contagious diseases. Foot and Mouth disease appeared in a very mild form in 4 herds and similarly Black-quarter in two herds and both subsided very quickly total mortality from them being only 8 and 5 respectively. Deaths from all other causes were 375, the percentage of mortality being 10 during the year as against 11.9 in the previous year.

213 cattle were protected against Rinderpest with goat-virus alone method in February 1933. 63 of them were tested with Bovine-virus after a lapse of two months and they were all found to be in normal condition and health and did not react. As an experimental measure one herd of 301 head of cattle was handed over to the Forest Department in 1931, but at the end of the year under report, the herd had dwindled down to 275 though no epidemic diseases prevailed, but on the other hand 149 were born in the herd. It is said that the conditions obtaining in Chamarajnagar Forests are not favourable either for the survival of young stock or for the prolongation of the life of the adults. More light could have been thrown on the conditions in those forests.

A new scheme called "Aided Cattle Breeding Scheme" was sanctioned by the Government and it was given effect to in the year under report with the result 800 cows and bulls (excluding 208 young stock) were sold away to 8 applicants who were all either headmen of these herds or their relatives. Similarly 16,000 acres of kaval (pasture) lands were leased out to these 7 people for the use of the cattle. This scheme effected a reduction of Rs. 4,452 per annum in the expenditure. There would also be an annual income of Rs. 1,600/- which is the lease amount payable by the aided breeders. These aided herds were duly inspected during the year and they were found to be in satisfactory condition.

There were 275 male and 290 female calves born during the year giving a birth rate of 32 per cent. Trained bulls and bullocks were as usual supplied to the several Government Agricultural Farms and 13 old and defective animals were sold away for Rs. 859. The village Panchayats in the State get their breeding bulls also from this Live-stock section paying a certain quota or on certain conditions. The work has increased considerably owing to the improvements introduced both in the Amrit Mahal and aided cattle breeding scheme herds.

The report gives the details of the working of the cattle breeding Station, Ajjampur during the year. In reviewing the report of the Civil Veterinary Department, Hyderabad, for the Fasli 1341, we have noticed that breeding bulls from Mysore Farm were purchased by the Government of H. E. H. the Nizam of Hyderabad. Ajjampur is a main cattle breeding station and Basur is its sub-station. The report gives details of very interesting and useful nature to the breeders under several heads such as rainfall, seasonal conditions, coverings, births, deaths, weight of calves, milk yield, feeding, condition of cattle, contagious diseases, training of young stock, sale of live-stock, production and disposal of dairy produce, pasture, crops and finance. Both the main and the sub-stations have served a very useful purpose in the rural economy of the State.

The report further deals with the work of Hebbal Dairy, Sheep Farms at Hebbal, Ajjampur and Yellachihally and sheep breeding extension work at Kolar. We feel we cannot do justice in reviewing in a quarterly such a report of various activities. We would therefore heartily recommend to all interested in the rural economics, a perusal of this useful report of substantial work. The Government review on the report records the work of the section during the year "was satisfactory." Lt. A. A. Monteiro and his staff should feel proud of this record of work.—M.S.

ERRATA.

In page 135, last line for 'The Indian Veterinary Medical Association' read 'The Mysore Veterinary Medical Association.'

Obituary.

Dr. JOHN RUTHERFORD ANDERSON.

We are deeply grieved to learn of the sad demise of Dr. John Rutherford Anderson in July last at Macon, United States of America, at the ripe age of 74, after an illness of three days with blood poisoning. The report in a local paper says that "a slight abrasion on his fore arm became infected while he was treating a sick cow in his dairy".

Unknown to us in person, separated from us by thousands of miles and nothing in common with us, excepting the love of the profession, this venerable gentleman of four and seventy years took a keen interest in our *Journal* and was a regular contributor of articles to its pages—a virtue which gains added significance when we come to think of the apathy of colleagues nearer home. At an age when senility and lethargy will generally predominate, this esteemed colleague of ours has been discoursing in our pages and in private communications subjects like Osteoporosis, Encephalomyelitis, etc. The last letter we received is dated 2nd June, 1934 and we never suspected that we would hear from him no more. Such foreign contributors were in no small measure responsible to cheer us up during moments of trial at home. Their unselfish love of the profession; their enthusiasm; their zeal; their perseverance and their devotion to what they considered to be their duty, have all been heartening us to our task. Would to God that we have more of this type in India!

Dr. Anderson is no more with us; but his example lives. It must be enduring in the hearts of all those, who bestow some thought over it. We offer our heartfelt condolences to the members of the bereaved family.

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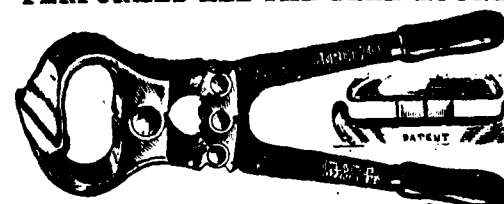
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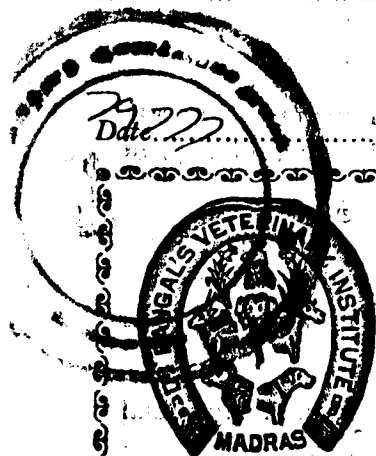
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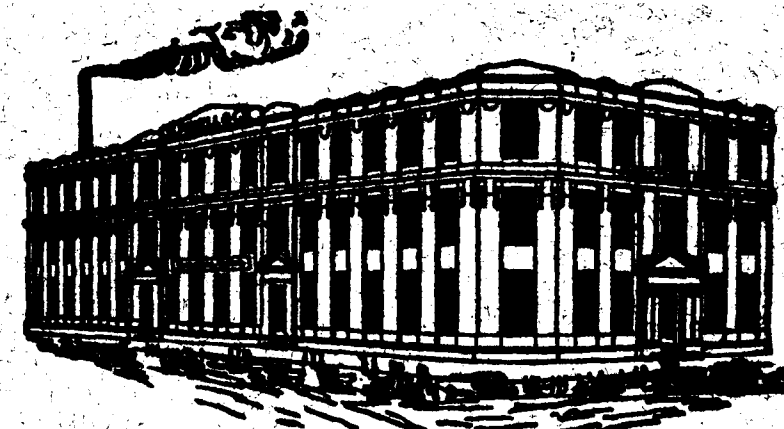
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