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Published Bi-monthly

(THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION)

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The Indian Veterinary Journal

(The Journal of the All-India Veterinary Association)



Editor:

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

Veterinary Surgeon, Madras.

Office: 26, WALLAJAH ROAD, MOUNT ROAD, MADRAS (S. INDIA)

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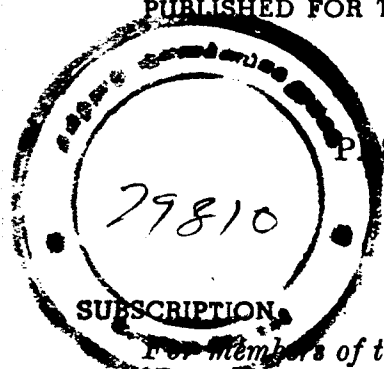
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EDITOR:

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



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Announcement.

THE ALL-INDIA VETERINARY ASSOCIATION

Dr. D. S. Laud, the present General Secretary of the All-India Veterinary Association, due to heavy pressure of work has resigned his General Secretaryship and the President Khan Sahib N. D. Dhakmarvala has requested the Treasurer Dr. M. S. Sastry to act as the General Secretary till the next Conference. Dr. M. S. Sastry has kindly accepted the post and all communications regarding the Association will, hereafter, have to be addressed to him to the following address:—

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Dr. M. S. Sastry, G.B.V.C.,
General Secretary,
The All-India Veterinary Association,
149, Margosa Road,
P. O. Malleswaram, Bangalore City.

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CONTENTS

I. General Articles	PAGE
Intestinal Calculi in Horses in India.—By A. D. MacGregor, F.R.C.V.S., F.Z.S., I.V.S.	1
On the Parenteral Administration of Sea-Water in the Treatment of Canine Mange—Sarcoptic and Follicular.—By K. Venkatachalam, A. N. Ratnagiriswaran, M. R. Subramania Sastry, R. Ramaswamy and C. K. Velayudhan Nayar	7
<i>Skrjabinema Ovis</i> (Skrjabin, 1915) Wereshschagin, 1925, An Oxyurid Parasite of the Goat (<i>Capra Hircus</i>) in India.—By S. N. Vaidyanathan, G.M.V.C.	11
Avian Leucosis in Madras Province.—By R. Venkataraman, G.M.V.C., F.G.	13
Evolutionary Adaptations in the Anatomy of the Locomotor System of the Equus Species—With Special reference to that of the Forearm and Manus.—By P. Srinivasan	15
Some Observations on Equine Piroplasmiasis.—By W. V. Soman, G.B.V.C., F.G. (Edin.), M.R.S.I., F.Z.S.	22
Artificial Insemination to Aid Improvement of Cattle.—By R. Veeramony, G.M.V.C.	28
The House Dog: Its Education and Training.—By Mahadevan	30
In the Realm of the Indian Veterinary Medicine.—By A. Krishnaswami, G.M.V.C.	32
II. Editorial	
One Thousand Crore Scheme	41
III. Clinical Articles	
Nasal Granuloma—Its Treatment under field conditions.—By B. Mohan Rao	43
Rabies in a Cocker Spaniel.—By D. Abdul Haffiz, G.M.V.C.	44
Uro-Lithiasis in Bovines.—By M. V. Subbarayudu, G.M.V.C.	45
A Successful Case of Urothotomy in a Buffalo.—By B. Sambamurti, B.V.Sc.	47
A Note on Chronic Luxation of Patella among bovines—With Special Reference to its aetiology.—By M. Ramakrishna Pillai, G.M.V.C.	48
Chronic Luxation of Patella in Cattle—An Investigation.—By Muhammad Rahimuddin, G.M.V.C., F.G. (Edin.).	55
Impaction of the Colon in a Zebra.—By M. Maqsood, L.V.P. (Hons).	58
IV. Correspondence	
"Double Spleen in a Goat" and "Echinococcus Cyst in the Kidney of a Cow."—Letter from P. C. Gangulee	59
"The House Dog: Its Education and Training."—Letter from Capt. A. C. Aggarwala, B.Sc. (Hons.), M.R.C.V.S., A.I.R.O., B.I.A.S.C.	60
My Impressions of the Conference of the A. I. V. A., Madras Branch, held in April 1944.—By a Delegate	61
V. Extracts	
Development of Agriculture.—1000 Crore Scheme	64
" " Madras Government's Attitude	65
" " Enough Food for all—Sir Pheroze Kharegot on Government Scheme	66
" " Policy Committee's Suggestions	67
VI. Errata	68
VII. Announcement	
The All-India Veterinary Association	iii

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The number on each calculus represents the stone or stones found in each individual horse.

THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XXI

JULY, 1944

No. 1

General Articles

INTESTINAL CALCULI IN HORSES IN INDIA *

By

A. D. MACGREGOR, F.R.C.V.S., F.Z.S., I.V.S.,

Principal,

Bengal Veterinary College, Calcutta.

It is difficult today to escape the conclusion that horses and their kind are on the wane—that they have lost somewhat of their splendour, like the moon after the full, and also to some extent even their reputation and power to please; their economic importance is almost gone, as the present war indisputably indicates. But in spite of all this unfortunate decline of the most beautiful, and we believe genetically perfect, of our domesticated animals—certainly the most complete in geological history—the horse still rests secure in an impregnable niche in the hearts of all who still breed, ride or race him.

It is to such people these lines are written; and withal by way of warning and possibly also of instruction; so that the animal we treasure, for love or gain, shall live longer with us, and escape unnecessary pain and agony, and death even, before his time.

It might almost seem ridiculous at first sight to launch out today on a campaign of this kind to change and redirect at least one aspect of the management of horses and their feeding especially into more modern channels of thought and experience. I am writing in the interests of the

* Reprinted from the "Indian Farming", December 1943.

horse first of all, but those interests are his owner's also, did he but know it.

STONES OF DESTINY

It cannot reasonably be disputed that bowel stones, concretions or calculi in the horse—enteroliths in more classical language—are a constant cause of discomfort and pain while forming, and a serious menace to life when disturbed from their original 'nests'; nor is it to be doubted as a consequence, that the horse's powers to 'perform' are reduced in like measure, as the stone or calculus grows and increases in size and weight. Therefore, if the outlook of preventing avoidable pain fail to rouse sufficient concern for the animal or interest in these notes, the implication of a consequential curtailed performance must impel attention to any explanation of preventive measures for these veritable "stones of destiny" of the horse. That this should be so—a victory of pence over pity—can claim little sympathy, but the furtherance of prevention of this condition is paramount. Appeals to sentiment have failed signally in the past to promote any but spasmodic efforts to correct the dietetic errors responsible for the creation of these calculi. Hence the necessity to our mind of making the following dogmatic and even dramatic disclosures—that on practically every occasion in India of a horse's dying prematurely after a severe attack of obstruction or obturation colic, and in which on post-mortem a calculus is found occluding the bowel, the blame for his death lies with the feeder or feeders (manager, trainer or others). But since horses frequently "change hands" so to speak, and these concretions may take months or even years to become of fatal size, responsibility cannot usually be traced to an individual but only to a partnership of successive delinquents; also, although a man may be punished for ignoring advice, he cannot surely, for pure and undiluted ignorance. Therefore in attempting to force this argument to a sharper point of utility, it is not our intention to indict anyone or even to accuse any set of people who look after horses today. But it will be their responsibility some day, if they persist.

ORIGIN OF BOWEL STONES

Intestinal calculi are known to originate in most instances by precipitation of magnesium phosphate in the large intestine when its contents are in an alkaline state (encouraged by the absence of vitamin D which neutralizes the bowel fluids). Magnesium Phosphate is carried by the food of the horse, but is most abundant in wheat bran. The magnesium phosphate content of small amounts of bran can usually be dealt with by the bowel, by absorption through the bowel-wall to the blood: but when in abnormal concentration (from excess or prolonged feeding of bran), this

excess magnesium phosphate combines with the ammonia formed during putrefactive or fermentative processes in the intestine to form phosphate of ammonia and magnesium; any available calcium in the vicinity (unabsorbed in the absence of vitamin D) will join up, forming an insoluble triple phosphate and crystallize on any hard substance like grit, a pebble, a hair or even on an undigested oat grain in the bowel. Like the proverbial maggot in the apple, the trouble has begun. Day in and day out, the initial and invisible nucleus grows, as layer upon layer or precipitated magnesium phosphate accumulates through the excessive bran-feeding. For be it noted, some 90 per cent of these bowel concretions or calculi are composed of phosphate of magnesium (from excess bran) and ammonia (from bowel fermentation); calcium carbonate and phosphate also contribute their quota but to a much less extent; and also in small quantities, sodium and potassium chlorides are sometimes found. So that the whistle blows and the signal is given to start this treacherous train of slow but none the less dangerous accretion of mineral matter, leading up to the fatal formation of a calculus in the bowel of the horse. And in essence, all as a result of feeding bran out of balance with other foodstuffs, and the inability of the animal to deal with the excess magnesium phosphate which bran invariably carries.

MILLER'S HORSES

It is unusual, one might say more or less correctly, for race-horses in training to receive bran in anything like excess for any length of time, excepting possibly while indisposed or at stud; they are ordinarily much more liable to suffer from a surfeit of oats (decalcifiers) far beyond their needs even in full training or their ability to digest them adequately. The result is that this type of horse while in training is seldom liable to develop calculi in his bowel—also his span of life is short as a rule, and unless he be put to stud or be lame or at rest and under treatment for long periods at a time the likelihood, outside such contingencies, of his being subjected to high bran-feeding is remote. However, both these contingencies are for ever present, and in our experience are quite frequently taking place, so that even young four to five and six years olds have developed and died of obturation colic caused by bowel occlusion from calculi. In all these cases, the horse was indisposed and under treatment for longish periods (up to six months at a time), and fed almost exclusively on bran during such intervals: also, instances of thoroughbreds at stud are not wanting which have died suddenly from bowel occlusion by calculi, due entirely to the erroneous and invidious practice of high bran-feeding during the "off" season.

There is no myth or mystery about this direct relationship between bran and calculi; it is a very simple story recorded almost a century ago,

e.g. that millers' horses, fat and sleek and invariably fed on the by-product bran (from their mills—cheap and economical?), invariably died from intestinal occlusion by calculi at an early age.

The feeding of bran to horses, during periods of illness, or after being blistered or fired or operated upon or prior and subsequent to periodical purging, became a habit and even a recognized custom a hundred or more years ago. Tradition dies hard and so in India today many horses as a result die unnecessarily. The practice of bran feeding exclusively during periods of rest, for whatever reason, is absolutely obsolete and out of all focus with modern knowledge of animal feeding principles.

CORRECT FEEDING

But be all this as it may, we must admit to having looked in vain in the literature for any clear condemnation of this dangerous and time-worn adherence to high bran-feeding, chiefly because it would seem no reasonable or adequate substitute was thought of. It is to be hoped the following system of feeding horses over periods of prolonged and unavoidable rest will be not only tried but will be accepted as being already proved beyond all question as the best means of meeting this very frequent contingency on the stud form, in the average racing stable and with the private horse-owner.

In respect of the solution of this problem of feeding horses while out of work or otherwise under conditions of compulsory rest, it will readily be seen that the writer has had unique experience, having been in control of probably the largest in-and out-door animal clinic in the East for over 20 years.

In all these years thousands of horses—racehorses, polo ponies, hacks and harness horses have passed through his hands and have been operated upon or so dealt with as to necessitate not only reduced diet and exercise but actually in innumerable cases no exercise at all for at least two to ten days at a time when they were tied up. This can be clearly understood from the nature of the diseases and operations concerned during these years: firing, blistering, roaring, cryptorchid, hernia, ovariectomy, pelvic fracture; and again with controlled diet but light exercise (walking only) such cases as eye-operations, sinus, teeth extractions, castrations, wounds, abrasions, etc.

For the past 12 years, the daily diet for all such horses (14·2 h. h. and upwards) has been as detailed below in this hospital, the only exceptions being those under preparation for 'physicing and 'deworming', when only grass or other green fodder or hay *ad lib.* have been allowed 24 hours prior to dosing. No preparation of cases even for major operations has been practised here, all getting their usual grain ration (as below) the evening before the day of the operation.

DAILY RATION

Oats : 3 lb. } This ratio of 3 of oats to 1 bran is constant and in quantity also
Bran : 1 lb. } constant during sickness of operation recovery without exercise,
but increased to 4½ oats to 1½ bran or even more with larger
types to 6 oats and 2 bran while convalescent and being exercised
or in poor condition.

Gram germinated : 2 lb. Constant.

Green fodder : 10 lb. Constant.

Salt : ½ oz. morning and evening in drinking water (and not in food) for better absorption. Constant.

Boneflour : (sterilized) ½ oz. daily only when lucerne not fed (chiefly during hot weather and rains) but never fed without cod liver oil.

Cod liver Oil : ½ oz. daily as with boneflour, only fed when lucerne not available.

VALUE DEMONSTRATED

As above emphasized, the regimen has been pursued in this hospital for the past 12 years and more, with almost meticulous persistency, and it can be said with accuracy that even with horses which have been tied up (and never 'let down' or walked out) for three weeks at a time not a vestige or sign of filled legs, digestive disturbance, or the slightest indisposition has been observed. This proves therefore the total absence of visible harmful effects of the above feeding formula over the periods recorded: that is in itself no small matter a stroke of success over the vexed question of compulsory heavy bran-feeding under like circumstances.

But to the sceptical mind, all this does not vindicate, first of all, the opinion expressed, that bran-feeding exclusively or in very high ratio to oats or other grain, does actually produce calculi; or second, that the formula now praised so highly and with good reason apparently may not also, over long periods, create similar concretions.

This aspect of the problem has already been explained and proved in our own prolonged experience; it is also vouched for in the literature in the experience of numerous close observers that heavy bran-feeding alone or with other grains does end in the formation of intestinal calculi sooner or later in the vast majority of horses so fed.

Of some 10 light riding school ponies (14·2 h. h.) in this hospital, all have lived for the past 12 years under the revised feeding conditions above stated; two were destroyed for other reasons last year but neither showed on post-mortem any trace of concretions. None of them during all these years ever had colic or any bowel disturbances whatsoever. Other instances are in mind of horses having been so fed for several years on end, with a similar record of freedom from digestive trouble or any semblance of impaction colic. And it is significant that all animals so dealt with, even when on the minimum ration of 3 lb. oats to 1 lb. bran and 2 lb. germinated gram, etc., have carried excellent condition.

VARIATIONS

The case has now been stated for this revised system of feeding horses as against a heavy or exclusively bran diet during compulsory rest or light work. But that specifically refers to the minimum of the formula prescribed, viz. 3 lb. of oats to 1 lb. of bran and 2 lb. of germinated gram etc. daily. Actually, there is no reason to doubt the efficacy of this formula for horses in work or in training, as the scope of the same ratio of oats to bran is unlimited, i.e., the benefits of the balance are not curtailed by stepping up the oats to say 9 lbs. or 12 lb. daily, provided the bran is not more rapidly raised in the ratio of 3 to 1; (9 lb. oats + 3 lb. bran + 2 lb. germinated gram: or 12 lb. oats + 4 lb. bran + 2 lb. germinated gram); either of these scales is a reasonable quantity of concentrates *plus* the other adjuncts advocated, for working and training purposes. But, of course, it must be accepted that a maintenance *plus* energy or production ration for man or animal is sufficient or not in keeping with his ability to digest and assimilate the same; and no two horses are alike in this respect. However, on this formula the choice remains between converting a safe ration for horses during periods of compulsory rest to that which, when stepped up, is suitable for work in all its phases of energy and speed. But this contention will, it is felt, be difficult for some to endorse on the basis of age-old accepted principles of feeding horses; that is especially when founded on the belief *that oats only and alone count* in the peak production of energy in horses and also that quantity is, above all, important, irrespective of all else—their assimilation and their absorption of the undoubted energizing elements they possess or even of their initial suitability for digestion in particular horses.

It is by no means uncommon in India to see horses being fed to the maximum of oats—18 to 20 lb. daily—toying with them for hours, on end, especially at night, and leaving to sour and waste in their mangers many pounds of good food; while, on the other hand, gross feeders may be seen choking their digestive apparatus ravenously with as many pounds of unwanted and unnecessary oats, resulting in their being passed whole in the dung.

But, fortunately or otherwise, we are not intrinsically concerned here by intention or design with devising a system of feeding horses for work, far less of a formula which is vainly expected to be possible of applying to each and every horse on the race course, the farm or in the average stable. Our purpose has been served by indicating to horse-owners a simple and safe way of getting over that hiatus in the feeding regimen of these animals which was previously filled by the erroneous and dangerous use of bran to excess. It is only, natural to hope that this, as it were, ancient 'bran-space' in the time-table of horse-feeding has been exploded and replaced by a more modern conception of feeding principles through the medium of the ration above indicated.

ON THE PARENTERAL ADMINISTRATION OF SEA-WATER IN THE TREATMENT OF CANINE MANGE—SARCOPTIC AND FOLLICULAR*

By

K. VENKATACHALAM, A. N. RATNAGIRISWARAN, M. R. SUBRAMANIA SASTRY,
R. RAMASWAMY AND C. K. VELAYUDHAN NAYAR,
Research Unit, Medical College, Madras.

The idea that some alteration in the mineral constituents of the blood may be responsible for some mental disturbances and the knowledge that the mineral constituents of sea-water are more or less the same as those of the blood led to the consideration that the injection of sterile sea-water may prove beneficial in the treatment of some of the mental diseases. Before venturing to try its usefulness on human patients, steps were taken to find out whether an injection of sterile sea-water into the animal organism would cause any systemic disturbances. Intravenous injections were therefore given to dogs which were chosen as the subject of the experimental investigation. In the course of such trials, one of the experimental dogs which accidentally happened to be a mangy one was found to be completely rid of its skin disease. All raw patches healed up, hairs began to grow in the denuded patches, and the animal began to put on flesh and weight gradually.

This finding prompted an inquiry into the efficacy of sea water on cases of mange confirmed under the microscope. Cases of sarcoptic mange numbering about 20 were first treated and all of them responded well to the treatment. Their general condition too improved. These results encouraged us to try the same treatment in cases of follicular mange also. The prognosis of this disease is generally considered not to be a favourable one, though it is said that spontaneous recovery (without any treatment) may occur not infrequently. Numerous remedies are mentioned by various authors. Some of them have been found to give relief generally in the scaly form, and not in the pustular form with numerous necrotic foci and large abscess formations. The pustular form is known to baffle all kinds of treatment invariably, and there have been numerous instances where cases with extensive infections over the body have been declared incurable and recommended for destruction considering it humane to end their suffering.

The pathogenesis of the disease is that the mites enter the hair follicles and sebaceous glands and produce a chronic inflammation with proliferation and thickening of the epidermis and loss of hair. A secondary bacterial invasion, usually by staphylococci, takes place leading to the formation of

*Reprinted from the "Indian Journal of Veterinary Science and Animal Husbandry," Vol. XIII, Part III.

pustules or abscesses. The wandering of the parasites aided by the biting and scratching by the affected animals cause the infection to spread over the body. But artificial infection from one animal to the other is rarely successful and this fact along with the reported incidence of spontaneous recovery indicates that the condition of the host is a strong factor in determining its susceptibility. It is also maintained by some authors that *Demodex* is a very prevalent parasite and occurs in practically all dogs, but produces mange only when the general health and condition of the animals are markedly affected by some debilitating disease or other causes, or when the natural resistance of their skin is weakened by some wrong treatment or other means (Monnig, 1938).

It is therefore clear that if sea-water should prove to be efficacious in the treatment of this malady it would really be a boon to the ailing animal kingdom. A few microscopically confirmed cases of this disease were therefore procured for carrying out the necessary trials. Sea-water in doses of 5 to 10 c.c. daily for dogs weighing about 20 to 30 lb. were given intravenously and no systemic disturbances were observed. Some difficulty was experienced at times in getting the needles into the vein on account of extensive raw patches and puckered and tumified condition of the skin especially over the limbs. To obviate this difficulty, the mode of administration was changed and intra-peritoneal injection were given every alternate day in doses of 10 c.c. Even daily injections were subsequently found to be tolerated. Half a c.c. per kilogramme of body weight was the average dose. The dose for under-sized and over-sized dogs was regulated on this basis, the maximum being 20 c.c. for the heaviest animal. Experience showed that it was necessary to exercise caution in treating highly debilitated animals, cases weighing less than 2 lb. and pups below the age of 6 months, since very small dogs and highly emaciated or famished ones and those suffering from bad form of nephritis were found to succumb probably owing to the difficulty in computing the proper dose for such patients.

Microscopical examinations of the scrapings of the affected animals taken from time to time in the course of the treatment revealed live parasites in the drying and healing stages of the lesions, dead ones at the later stages of the healing process and none at the end of the treatment. These indicate that sea-water has so altered the tissue conditions as to make the soil unsuitable for the parasites to live in. About 30 cases in the different stages of the disease were treated both in this Laboratory and outside. Two small dogs, two emaciated ones and one with nephritis succumbed and all the rest were found cured after 20 to 30 injections. Their general condition also improved, and the disease never recurred in any of them. The improvement in the general condition began to manifest generally a week or ten days after the cessation of treatment.

This remedy was then tried on microscopically positive cases of follicular mange in some of the local institutions. The results of such trials invariably tallied with our observations. The reports received from those quarters indicate that the disease never recurred in any of the cases treated, except in one case which was a long-standing one and which required 3 courses of 20 injections with an interval of 10 days between each course, that in early cases only one course was found sufficient though some required two courses and in certain long-standing cases even three courses were necessary, and that no ill effects were noticed but on the other hand a definite improvement in the general condition of the patient was seen.

Photos of a typical case of the pustular form of follicular mange with numerous bald patches and abscess formations almost all over the body giving rise to offensive sanguino-purulent discharge and with numerous ulcers and necrotic foci were taken both before and after treatment. It weighed nearly 10 kg. As a precautionary measure it was given only 3 c.c. to start with by the intravenous route and later on intra-peritoneally as well as subcutaneously on account of the smallness of its size and its debilitated condition. The treatment was continued for nearly three months and a half. It became perfectly all right after prolonged treatment with this remedy. It improved very well in condition. There was no sign of any recurrence of the disease even after the lapse of a pretty long period after it was discharged cured.

A Hallikar bull suffering from ringworm with sores all over the body was also treated. The bull had two courses of injections intravenously with a dose of 40 c.c. and 60 c.c. respectively. It was under treatment for about four months and was completely cured. No other treatment was adopted in this case.

CONCLUSION

The results of the trials made so far with sterile sea-water on cases of sarcoptic and follicular mange have been very encouraging. The report about the successful treatment of a ringworm in a bull suggests the possibility of its usefulness in the treatment of this malady also. Its efficacy in the treatment of other varieties of mange as Psoroptic, Choriopic, etc. and in different species of animals are worth trying. It is left to the clinicians to try it extensively in different forms of skin affections and in different species of animals and study the effects; but in computing the dose for various kinds of animals, care must be taken to assess the individual requirements, taking into consideration the general condition of the patient, its size, age and weight. Usually one course of 20 daily injections intraperitoneally may be enough for dogs. Occasionally two or even three courses may be required depending upon the severity of the disease. If more than

one course is found necessary, an interval of ten days may be allowed between two courses. Attempts are being made to minimize the period of treatment with a view to obviating tediousness that is likely to be caused to owners of patients by the present lengthy course of treatment. The sea-water for these trials were procured from the sea beyond 100 yards from the coast with the help of fishermen.

The fact that favourable results were obtained so far by the use of this remedy through a paranteral administration and not through a local application clearly shows that the cure brought about by sea-water has been effected by improving the general health and condition of the host and thereby altering the weakened state of the tissues in such a way as to make the soil unsuitable for the parasites to live in. It would thus appear that an invasion by *Demodex* parasite is likely to take place only when the soil is made suitable for its growth and multiplication by a deterioration in the general health and condition of the host or a weakened condition of the skin. The observation that artificial infection of healthy animals has not always been successful substantiates this view. Further, the statement that spontaneous recovery may occur sometimes also supports the above fact, since such a recovery may be attributable to an improvement in the general health of the animals consequent on favourable changes in their living conditions. The results of our treatment thus lend support to the view held by Monnig that 'the condition of the host is a strong factor in determining the susceptibility to an infection by *Demodex*'.

The conditions that favour an invasion by these parasites and the physiological changes which sea-water induces so as to make the soil unsuitable for the parasites to live in, still remain to be investigated.

SUMMARY

1. The injection of sea-water intraperitoneally as well as intravenously has been found to effect a complete cure of cases of sarcoptic and follicular manges in canine patients. About 20 cases of the former variety and about 30 cases of the latter variety were treated both in this laboratory and outside with success.

2. The general condition of the affected animals has invariably been found to be greatly improved as a result of treatment with this remedy.

3. A dose of $\frac{1}{2}$ c.c. per kg., of body weight, the maximum being 20 c.c. for the heaviest animal, has been found to be tolerated generally, and the mode of administration is intraperitoneal given every alternate day or even every day. Caution should, however, be exercised in treating highly debilitated animals and those previously suffering from nephritis and cases weighing less than 2 lb. or pups below the age of six months.

4. A case of ringworm in a bull was also treated with success. It had two courses of injections intravenously, with a dose of 40 c.c. and 60 c.c. respectively. The period of treatment was four months.

5. The results of treatment made so far confirm the view that the condition of the host is a strong factor in determining its susceptibility to an infection by *Demodex*.

ACKNOWLEDGEMENTS

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SKRJABINEMA OVIS (SKRJABIN, 1915) WERESCHTSCHAGIN, 1925, AN OXYURID PARASITE OF THE GOAT (*CAPRA HIRCUS*) IN INDIA*

By

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Abdussalaam (1938) appears to be the only worker who has recorded *Skrjabinema ovis* in India. His collection consisted of two female worms which were recovered alive from a speck of mucus passed by a one-year-old fat-tailed sheep suffering from diarrhoea at Jahania (Punjab). According to him, the specimens are in conformity with the Russian and British specimens, in all important measurements.

During the contagious caprine pleuro-pneumonia experiments conducted at the Madras Veterinary College, the writer, in 1939, while collecting parasites from goats, came across members, both males and females, of

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an oxyurid parasite indistinguishable from *Skrjabinema ovis* in the colon of several goats; so opportunity is taken to record, for the first time, their incidence in goats in India.

The following is a brief description of the worm, from typical specimens of the Madras collection:

A very marked feature is the difference in size of the sexes. The male measures up to 3.50 mm. and the female 7.00 mm. A small buccal cavity bounded by a complicated arrangement of lips and interlabia of the tri-radiate type can be made out. The head end bears a cuticular inflation which is more marked in the female than in the male. A pair of lateral alae, bearing fine striations, run along from behind this inflation. The lateral alae are less prominent in the male than in the female. In the female the alae extend almost the entire length of the worm, except for a short distance from the hind end. The lateral alae in the male appear to be contiguous with a caudal alar expansion. The oesophagus is cylindrical, with a large spherical bulb posteriorly. The cylindrical portion measures 0.35 mm. in the male and 0.60 mm. in the female. The diameter of the posterior bulb is 0.12 mm. and 0.20 mm. in the male and female respectively.

The caudal alar expansion of the male is almost circular in shape and held in position by a pair of pre and post anal processes. The preanal processes are much larger of the two and bear at their tips a small papilla each. The papillae at the end of the processes protrude outside the alar expansion. Between the bases of the processes and situated adanally, may be seen a pair of swellings behind the cloaca, each bearing three minute pupillae. The tail of the male ends in a short, conspicuous spike. A single stout spicule measuring 0.08 mm. glides on an accessory piece 0.023 mm. long.

The female has a distinct tail measuring 0.80 mm.; the vulva is situated anterior to the middle of the worm. It leads into a broad vagina, directed obliquely forward.

PATHOGENESIS

According to Abdussalaam (1938), 'the diarrhoea and other symptoms in the host animal at Jahania (Punjab) were too severe to be attributable to the presence of this parasite'. Monnig (1934) considers they are 'apparently not pathogenic, but may be mistaken for young forms of other nematodes'. The writer did not observe any symptoms in the goats, from which these specimens were obtained, that could be attributed to this parasite.

INCIDENCE

Out of 70 goats subjected to a random examination as many as nine had *Skrjabinema ovis*. These were found mostly amongst the younger lots. The percentage incidence of *Skrjabinema ovis* in goats, judging from the supply for the contagious caprine pleuro-pneumonia experiments, from different localities, not only in and around Madras but also places far off, suggests the possible distribution of this parasite throughout this part of the country.

ACKNOWLEDGEMENT

The writer is indebted to Rao Sahib M. Anant Narayan Rao, Lecturer in Parasitology, Madras Veterinary College, for kindly confirming the identity of the specimens.

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AVIAN LEUCOSIS IN MADRAS PROVINCE*

By

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During recent years, there has crept into our flocks of poultry in this Province, a disease which has caused great concern to the poultry industry. This disease is popularly spoken of as "Fowl Paralysis or Range Paralysis", in view of the most prominent and visible symptoms, viz. paralysis. This term is inadequate and misleading as it is applicable to only one form of the disease and a symptom which may be seen in other diseases, viz. Ranikhet disease, Spirochaetosis, Fowl Cholera, Avian Coccidiosis* and heavy helminthic infestations especially *Davania* Sp.

Geographical distribution:—The incidence of this disease varies considerably and has been recognised practically over the whole world, having been reported at Great Britain, Europe and America by Bayon, Blackmore, Dalling, Mazek, Meissner, Hall, Kauff and other workers.

In India, the incidence of this disease has been recorded in Bombay Presidency in 1933, in Mysore in 1937 and in Madras in 1942.

Etiology:—The etiology of this disease is believed to be a filterable virus manifesting in three main types, viz. Erythroleucosis, Nural Lympho-

* Paper read at the Provincial Veterinary Conference of the A. I. V. A., Madras Branch, on the 15th and 16th April 1944.

matosis and Myeloid leucosis all being pathological conditions set up in the tissues.

The disease appears to be an imported one into our country since it is observed mainly in the exotic breeds primarily affecting fowls especially young stock, viz. Cockerels and Pullets.

Symptoms:—The symptoms exhibited by the affected birds vary according to the sites involved. At the onset of the disease, symptoms may be slight and scarcely noticeable such as a slight limp or weaving gait and a partial dropping of a wing. Sometimes the bird knuckles over the toes and is unable to perch. Later, the leg or wing may lose more and more of their usefulness until the bird is unable to stand or the wings become limp and dragging. A characteristic posture in an advanced course of paralysis is one in which the bird lies on the side of the breast with one leg extended forward and the other backward. Being an insidious and progressive disease, no marked elevation in temperature occurs; the birds however, retain their alert appearance after paralysis has set in and except for their inability and helplessness to reach their food, they apparently look normal; this feature will help to differentiate paralysis due to other causes. In prolonged cases progressive emaciation occurs, the birds becoming anaemic with pallid wattles and combs; the condition "pearly eye" occurs in ocular lymphomatosis.

In our province, the disease was noted first at the Livestock Research Station, Hosur, where it started in the Black Minorca breeds and later affected other exotic breeds also: the outbreak lasted for over 6 months and being an insidious disease, deaths were occurring spread over at varying intervals after the manifestation of symptoms. Unlike other contagious diseases of fowls, this disease does not rapidly spread in the flock and cause heavy mortality in the course of a few days.

Six fowls, Cockerels and pullets, were received from Hosur for investigation as they were all ailing from paralysis of the legs and they were kept under observation for a period up to 40 days by which time they had succumbed. Autopsy revealed enlargement of the nerve supplying the affected limb and in one case, nodular enlargement of the sciatic nerve was seen with tumour formations on the kidney and testicles. Microscopical examination of the affected organs revealed lymphomatosis; thickening of the opineurium of the sciatic nerve with degeneration of the nerve bundles was also noted accounting for the paralysis; in the earlier stage, oedema and lymphocytic infiltration was noted on microscopical examination. The incidence of this disease was also confirmed at the Central Farm, Coimbatore.

Sources of dissemination:—Purchasing eggs for setting purposes from infected farms and breeding from fowls of known hereditary susceptibility are factors which favour dissemination.

Prevention and control:—Being a filterable virus, transmitted through the egg, laying mothers should be weeded from the breeding stock; birds with grey or pearly eyes should be eliminated and should not be used for breeding. As there is no treatment for combating this condition, control measures should be direct towards spotting out the affected birds as early as possible and destroying them if the incidence is high. Good sanitation and hygiene should be observed and a well balanced diet rich in proteins and without deficiency of vitamins should be given. Control of endoparasites is also not a negligible factor. Building up a strain of disease resisting birds, but not recovered birds should be aimed at in view of the genetical factor involved.

EVOLUTIONARY ADAPTATIONS IN THE ANATOMY OF THE LOCOMOTOR SYSTEM OF THE EQUUS SPECIES

With Special Reference to that of the Forearm and Manus

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The evolution of the horse has for humanity a very deep interest because of the debt of gratitude which man owes to this humble servitor and comrade in the long and arduous journey from savagery to civilization, first in savage days as an easily obtainable food and later as a partner in his labours. The horse has always been a noble and indispensable part of the labour of the world. In war or in peace he has always been of unfailing aid and friend of man without whose aid human progress towards a higher civilization would have been retarded immeasurably.

Geological studies show that horses were found in continents of America, Europe and Asia from time to time but the sequence of their evolution has not been worked out as completely as in North America. Hence Geologists infer that North America was the real theatre of equine evolution while the animals found in the other parts of the world are merely relics of genera which have migrated thence from time to time. The earlier migrations are not of sufficient moment but that which had occurred during the pliocene period (about one million years ago) was the final one as there was then a total migration to the other continents of Asia, Europe, Africa and South America with the result that for some unknown reason they had become extinct in the new world.

Before proceeding to examine the various genera in the successive stages of equine evolution, it may be of interest to know about the Geologic period during which these evidences have been recorded and about fossils. The distribution of animals in time is an important factor to understand the evolutionary racial history (Phylogeny).

Geologists as a result of the study of the rocks and minerals have divided the earth's past history into a number of major divisions called Eras—Archeozoic and proterozoic (primitive life), Paleozoic (ancient life), Mesozoic (medieval life) cenozoic (modern life), and Psychozoic (mental life). Of these, the first consists of the age of primitive invertebrates; the second, the age of higher invertebrates and fishes and Amphibians; the third, the age of reptiles and aves; the fourth, the age of mammals; and the last, the age of man. The cenozoic era or age of mammals represents a recent chapter in the history of life and primitive mammals came into existence only about 60 million years ago. This era is further subdivided into six periods and the following outline will be useful for reference in connection with the ensuing discussion of the equine evolution.

ERA	PERIODS	DURATION OF YEARS
Cenozoic	Paleocene	5 million years.
	Eocene	20 do.
	Oligocene	16 do.
	Miocene	12 do.
	Pliocene	6 do.
	Pleistocene	1 do.

The psychozoic era or the age of man began about 25,000 years ago and is the period in which we are now living.

Life of the past is studied from what are known as fossils—the remains of plants and animals that once lived on the earth and subsequently got preserved either as such or as petrefactions or molds and casts. Actual remains are simply dead organisms or their parts which have been preserved as such by being frozen in ice as for example in the arctic tundras of Siberia. These fossils are very rare. Petrefactions are original materials more or less mineralised to a certain extent. These are almost invariably hard parts of the animal's structure as bones, teeth etc. This process is a very slow and gradual replacement, molecule by molecule of the original substance by the minerals and hence retains not only the external form but also the internal structure as well. Molds are only impressions or cavities created by the hardening of the surrounding material in which the organism is buried and subsequently no trace of the original material can be seen.

These molds may later on get filled up by mineral matter and thus a natural cast is formed. These molds and casts give only an idea of the size, shape and other external forms of organisms by means of which a fairly accurate restoration of the original form may be made and hence are valuable for study. It is by means of these fossils which have been found in the different periods of the geologic time, that a sequence of events in the phylogeny of the equus has been built up.

The earliest forms probably arose from an extinct group of archaic mammals—a condylarth, a hypothetic ancestor having five digits in each limb. However the first horse-like forms were recorded in the Eocene period—(about 55 million years ago). These were animals averaging about three hands or twelve inches in height with short head and neck and with limbs of moderate length showing the digitigrade character of the feet (walking or running on the digits with the carpus and tarsus and the upper ends of the metacarpal and metatarsals clear off the ground). The forelimb had four complete digits each terminating in a hoof-like nail with no trace of the first digit. The hind limb had only three digits with vestiges of the first and fifth digits. Both the ulna and fibula though slender were still complete and separate. These animals are called as Eohippus. The further advance in evolution is indicated in the next stage by a further increase in size of the animals, by the loss of the splints of the first and fifth digits of the hind limb and the slight increase in the size of the middle and shortening of the outer digit of the forelimb. This genus is referred to as Orohippus. In the third stage the outer digit of the forelimb had decreased still further but was still functional and the middle digit of the hind limb began to dominate. This type is referred to as Epihippus.

During the oligocene period (20 million years later) two genera are recorded. In these, the forelimb had only three digits and the fifth was represented by a small splint bone and the hind limb had still three digits though the middle one was much the largest and bore more of the animal's body weight than the laterals. The ulna was very slender but still complete and separate and the fibula became greatly reduced and partly fused to the tibia. The average height of these animals was about five hands. These genera are termed as Mesohippus and Miohippus, the latter differing from the former only in its larger size.

In the Miocene period (16 million years later) three genera are of particular interest. The animals grew considerably larger in size being about 8 to 10 hands in height. Each of the fore and hind limbs still had only three digits but the middle digit was much more dominant and the lateral digits did not reach the ground and hence bore no weight. The ulna had lost its lower two-thirds and the proximal part only which was retained was fused to the external part of the lack of the radius. These

three genera are the Parahippus, Merychippus and Protohippus of which the first one resembles closely the previous stage and the last one the next stage.

The Pliocene period (10 million years later) is represented by three genera closely related to each other. Each of the four limbs had only one digit though in rare instances vestiges of the lateral digits seemed to have persisted. The general proportion and size of the animals increased to about 12 to 14 hands. The first two genera recorded are the Plihippus and Plesippus. The latter genus gave rise to the Equis, the tenth and the final stage recorded in America and marks the culmination of the race. The feet had only one digit and the ulna, of which the proximal part only is retained was always fused to the radius. The animals assumed a maximum stature consistent with fleetness, the average height being 16 hands. During this period there was an almost total migration of these animals into the continents of Asia, Europe, Africa and South America.

During the Peistocene period (6 million years later) this genus of Equis had become extinct on the American continents and in Europe for some unknown reason and survived only in parts of Africa and Central Asia. They continued their existence there without much modification during this period as well as in the Psychozoic era (present time). The size and general proportion averages about 16 to 18 hands in height.

The foregoing account of the phylogeny of the present day Equis proves that horses were once pentadactyl mammals in whom evolution and cursorial adaptations have brought about profound changes in the animal mechanism to suit the ever changing environments and science explains that these adaptations are carried on by a process of natural selection extending over millions of years. A brief survey of the adaptations which the archaic horse-like mammals have undergone to develop into the modern equus will be of profound interest and value. These changes are in the last analysis, reducible to two things—the perfection of the masticatory and locomotor apparatuses.

The specialization for speed necessitated changes in the form and general appearance. The horse has its body moulded externally in such a way as to offer least resistance to the air, the medium through which it has to pass. The body, head, and neck are smoothly rounded with no needless excrescences and with perfect symmetry of form. The same kind of symmetry is maintained in the limbs which are long and slender distally with the massive muscles at the shoulder and hip where they blend with the contour of the body, their force being transmitted by long and slender tendons. This concentration of weight high on the limbs quickens the speed without diminishing the stride.

The propelling organs are exclusively the limbs so that apart from the resistance being lessened by the contour of the body, the adaptation consists chiefly of their modification. The limbs, in addition to their functioning as supports to the body in a standing posture, have also to transport it during progression and that especially in quick motion. This double function gives rise to a differentiation in the development of the two limbs. The forelimbs being nearer to the centre of gravity than the hind, have to sustain the largest share of the weight of the body. Hence the forelimbs become considerably specialized as organs of support. The hind limbs are less favourably disposed than those in front to assume the function of columns of support. The bony components of this limb are all kept in a state of permanent flexion and jointed in an angular manner to one another. The open angles are prevented from breaking down by muscular power. Though less favourably modified as agents of support they are admirably adapted for locomotion. The slightest erection of these inclined bones projects the mass of the body forwards and this propulsion being transmitted to the trunk in consequence of the very intimate union of the pelvic bone with the vertebral column. This kind of modification in the disposition of bones of the posterior limb naturally raises the points of insertion of the muscles around the thigh and thus increases the angles of insertion which gives a greater propulsive force across the femur. As the muscles are shortened they are made thicker which also increases their power and force of contraction.

Almost the first step in speed adaptation is the lengthening of the limb and this is accomplished by merely raising the heels. The foot posture gradually undergoes modification. The feet show the digitigrade character. The elevation of the heel carried reduction of the number of digits along with it. With the progress of evolution the modern equus shows the unguligrade character bearing at first four, later on three and finally one digit only. The carpus, metacarpus and the first two phalanges are clearly off the ground and the entire weight is borne by the terminal phalanx. To suit to this requirement this phalanx came to be enclosed in complicated and perfected mechanism. This consists of sensitive, elastic and horny structures. The sensitive structures have the function of secreting the horny structure—the hoof which takes up the function of protection of the softer structures inside as well as to form the bearing surface of the foot. The elastic structures as the lateral cartilages, the plantar cushion and the frog are of great importance because of their shock-absorbing function which guards the system from the great concussion produced by the impact of the foot with the ground.

Concurring with the digital reduction and lengthening of the limb is a compacting of the bones of the metacarpus and metatarsus. The second

and fourth metacarpals are represented by comparatively slender and tapering rods which fail to extend to the full length of the third metacarpal bone. The distal end of each rudimentary metacarpal bone presents an enlarged appearance probably due to the fusion of the rudiments of the phalanges to it. The third metacarpal bone however increases considerably in thickness, length and strength.

The diminution of the digits, the compacting of the bones of the metacarpus and metatarsus and the necessity to adapt for speed tend to cause a reduction of the skeleton of the forearm. The bones of the forearm—radius and ulna are retained and well developed in slow moving forms especially if rotation on the forearm on the arm is retained. On the other hand when the limbs are exclusively adapted for speed and are purely locomotor in function there is always a tendency for the reduction of the ulna. The two bones become fixed permanently in a position of pronation. In the final stage the ulna loses its lower two-thirds being completely fused to the radius and its proximal extremity is slowly pushed outwards.

In addition to the above, there are certain other features with regard to the simplification of the ulna which are of interest. In the plantigrades, the ulna has a shaft and two extremities. The shaft tapers from above downwards and the inferior extremity terminates in a rounded head or in a long thin process. It presents at its superior extremity a posterior process—the olecranon process and an anterior process—the coronoid process. The head of the radius is situated on the anterior part of the external surface of the superior extremity of the ulna and its articular cavity is situated outside the coronoid process. In the digitigrades the head of the radius is situated more to the front and finally in unguligrades it is placed directly in front. This displacement of the radius is made at the expense of the superior extremity of the ulna. The radius appropriates more and more of the parts which belong to the ulna—the coronoid process which really belongs to the ulna in plantigrades, is made up half each of the radius and ulna in digitigrades and completely by the radius in unguligrades. In brief as the foot posture is adapted from plantigrade to digitigrade and unguligrade, there is a kind of progressive development of the radius at the expense of the ulna. This partial disappearance is explained by noting that in the horse movements of pronation and supination are absent and hence the lower end of the ulna becomes functionally superfluous and disappears but the olecranon becomes considerably developed as this limits the movements of the extension of the forearm.

Another feature of speed adaptation is the restriction of movement in all the joints except the shoulder and hip. The freedom of movement in these two joints is retained in order to avoid interference between fore and

hind limbs while running. The disappearance of the clavicle and the absence of an articulation between the shoulder blade and the rest of the skeleton also allows freedom of movement in a certain plane. Motion in all other joints is made by a system of hinge joints permitting only fore and aft movements.

The digital reduction, compacting of the bones of the metacarpus into a single cannon bone, reduction of the ulna and restriction of movement in joints are naturally associated with great modifications in the muscular apparatus. Some muscles fail to develop and one of them undergoes alteration in structure. Similarly the complicated and anastomotic system of blood vessels and nerves gets considerably simplified.

As the forearm is kept permanently in a position of pronation of pentadactyles, the muscles that were to act as supinators, pronators, and rotators of the forearm have altogether disappeared. The abductor pollicis longus which was inserted to the first metacarpal bone and was intended to abduct the first digit has come to change its name, attachments and action. It is named the extensor metacarpi obliquus and is attached to the second metacarpal bone and is intended to extend the carpal joint.

The extensor metacarpi magnus (extensor carpi radialis) represents both the extensor radialis longus and extensor radialis brevis of plantigrades. In the digitigrades these two muscles are united in their upper half, the lower half being succeeded by two tendons attached to the second and third metacarpal bones. In the unguligrades the two muscles fuse together completely and the fused mass gets succeeded by a single tendon attached to the third metacarpal bone. The attachment of the ulnaris lateralis (flexor metacarpi externus) is shifted from the proximal extremity of the fifth to that of the fourth metacarpal.

The extensor muscles of the second, third and fourth digits which were separate in plantigrades and digitigrades have, in unguligrades, come to be fused into a single muscle and is named as the common digital extensor. Of this, its humeral head represents the anterior extensor of the phalanges of the third digit; the radial head represents the common extensor of the fourth digit and is also known as the 'Muscle of Philips'; the ulnar head represents the extensor proprius indicis and a part of the common extensor of the second digit and is known as 'Muscle of Thiernesse'. The lateral digital extensor of the pentadactyls is little developed.

The flexors which were succeeded by as many tendons as the number of digits in the previous stages have in the final stage become much more

simplified and each is succeeded by only a single tendon. These tendons play a very important part in the maintenance of the angle formed by the cannon bone with the digits. In addition to their greater development and strength they are further reinforced by two strong check ligaments—superior and inferior.

The abductors, adductors and flexors of the digits are not developed. No vestiges even of the muscles of the first and the fifth digits are seen. The vestiges of the muscles of the second and fourth digits may still be recognised and these are the lumbricales and the interossei. Of these the lumbricales arise from the deep flexor tendon and get lost in the fibrous tissue under the ergot. The interossei are three instead of four. The lateral ones are ill-developed and get lost in the fascia of the fetlock. The middle interosseous muscle is so much modified that it is usually termed as suspensory ligament and is fibromuscular in structure. Its chief function is to support the fetlock in order to maintain the unguligrade posture of the modern equus.

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SOME OBSERVATIONS ON EQUINE PIROPLASMOSIS

By

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Introduction. Piroplasmosis is an acute or chronic relapsing fever of almost all the domesticated animals each susceptible to its own specific form. The causal agent is an intra-corpuseular protozoan parasite. The disease in the equines is commonly known as Biliary fever. Idiopathic congestion of the liver associated with digestive disturbances as after the imperfect absorption of highly concentrated nitrogenous material may also give rise to symptoms similar to biliary fever; but these symptoms disappear quickly after appropriate treatment.

Equine biliary fever is caused by two kinds of blood parasites—*Babesia caballi* and *Babesia equi* (Nuttallia equi). The former parasites are

pear-shaped and resemble *Babesia bigemina* of cattle and occur in the red blood corpuscles of the affected animals, while the latter are smaller and have characteristic maltese cross forms in a small percentage of R. B. corpuscles.

Local Outbreak. Cases of the disease were first detected amongst the State Cavalry Units in the summer of the year 1936 amongst the Australian Remounts purchased from the Calcutta Remount Depot. Till then the State Cavalry had Indian bred horses. After 1936, the number of fresh Australian Remounts increased every year and cases of Piroplasmosis also increased proportionately more or less. During the last eight years 261 cases of Piroplasmosis were recorded. 90 per cent of the cases were from the recent draughts from not less than two years standing. Recently a few cases amongst aged Walers and Indian bred horses have also been recorded. The Indian bred horses affected were particularly of advanced age, over fifteen years. A young hill pony was affected by the disease and appeared more susceptible to it. After the first case of Piroplasmosis in the State Cavalry Lines every horse was searched for ticks and during the period of the last eight years only half a dozen horses were found to be infested with them. The ticks were identified at the Imperial Veterinary Research Institute, Mukteswar, as *Dermacentor reticulatus*, *Rhipicephalus Sanguineus* and *R. bursa*.

As a very large number of cases of Piroplasmosis have been recorded during the early months of the monsoon, when biting flies are in abundance and ticks were not present on many of the affected animals, there appears to be sufficient reason to suspect that biting flies could also be the carriers of the disease in addition to ticks.

Etiology. Both kinds of Piroplasms were found in the blood of affected animals. *Babesia equi* invariably predominated every case and when its virulence was reduced after treatment, *B. caballi* showed itself in the blood. In certain cases both the organisms were found necessitating treatments for both the infections.

Treatment was successful in a large percentage of cases and about 4.5 percentage of cases alone proved fatal. Recovered cases did not show any immunity to a subsequent infection which occurred in a minimum period of six weeks. Some cases though free from parasites showed extreme anaemia and did not respond to any tonics like Arsenic, Ferri Salts, Cod Liver Oil, special feeding of vitamin "A" and "D", green fodder, Cerelese "H" and liver stimulants. A few cases that died showed the following post-mortem lesions:—

All the internal organs, the subcutaneous and subserous tissues were yellowish in colour, blood watery, lymph glands and spleen enlarged and

inflamed and in some cases the splenic pulp was found softened. Two cases showed signs of Endocarditis and one which had symptoms of Pericarditis during life was confirmed during post-mortem. In certain cases oedema of lungs and kidneys were noticed associated with petechial haemorrhages. In general the cases showed symptoms of anaemia. All the above symptoms were noticed in cases that died of the disease.

Symptoms. The first symptom noticed was an icteric mucosa with pin point haemorrhages associated with a high temperature. The petechiae appeared to be in proportion with the fever. On examination, the action of the heart was weak and much accelerated and respirations laboured. But this was noticed more in recurring attacks. During the first attack the animal looked much normal and kept on feeding well till the temperature shot up to 105°F. The appetite diminished as the disease advanced and thirst increased with the temperature. The faeces were scanty, constipated and coated with mucus. Diarrhoea was never noticed. Urine was passed in large quantities and often yellow or dark red in colour. On blood examination the majority of the cases were found infected with both the organisms. The number of Red Blood Corpuscles went down to 3 to 5 millions per cmm. No early cases of the disease were recorded but during the second and the subsequent relapses cases showed milder symptoms: and it was then found that these cases showed *B. caballi* alone in their blood. Presence of *Babesia equi* was never detected in these cases. Citric Acid Test in these cases showed the number of red blood corpuscles from 2½ to 3½ millions per cmm. Chronic cases were detected by the occasional rise of temperature, diminished appetite, general debility and gradual emaciation. In advanced weak cases, irregular and at times jugular pulse were also recorded. *B. caballi* was not easily detected in every case but after examining a number of slides, it was taken for granted that every case of relapse with a temperature ranging between 103°F. to 104°F. and the red blood corpuscles count from 3½ to 4½ millions per cmm. was infected with *B. caballi* and the animal treated accordingly.

Prognosis. Infection with *B. equi* was found more virulent than with *B. caballi* with more pronounced symptoms as a very high temperature ranging from 105° to 107·6°F. (maximum recorded) and intensive petechiae of the mucosa. Ordinary precautions to lower the temperature by means of enemata, ice on head, doses of diaphoretics and allied treatments were given before the specific injections were tried. No case of death from severe infection of *Babesia equi* was recorded during the last eight years. Cases of *B. caballi* showed milder symptoms and never required any immediate specific treatment. But it was always found safer to administer the specific injection as early as possible before the disease established itself and affected the general condition of the animal.

Treatment:—Various drugs, Trypan Blue, Trypaflavin, Gonaerine and Tartar Emetic were tried with varied results. Yellow Acid Quinine Hydrobromide—one drachm, dissolved in 40 c.c. of distilled water was given intravenously with excellent results. The effect of the drug was noticed within a few hours of the injection resulting in a gradual fall of temperature to normal within twenty-four hours. The effective dose of Acid Quinine Hydrobromide was found by experience to be one drachm per 800 lbs. of body weight. The maximum dose injected intravenously was 1½ drachm in 50 c. c. of water in Hungarian horses weighing about 1400 lbs. The usual ill-effects of Quinine on the heart were noticed in many cases. This was remedied by subcutaneous injections of Suprarenin. 50 c. c. Saline solution was also given prior to the injection of Quinine and after.

The Quinine solution was not injected by the syringe but was allowed to flow down into the vein from an intravenous outfit. This considerably lessened the risk and no case of heart failure was recorded during the last eight years. Acid Quinine Hydrobromide dissolved in a 5 per cent Glucose solution gave more satisfactory results.

In certain cases there was a relapse after a week of ten days necessitating a second dose. Such cases were very few about one per cent. The cases that relapsed, usually showed the presence of the other organism, viz. *B. caballi* and Acid Quinine Hydrobromide had no effect on this. Acaprin was, therefore, tried and gave excellent results in the infection of this organism. 6 c. c. of a 5 per cent. solution was sufficient for a horse weighing about 800 lbs. This drug has also given good results in the infection of *Babesia equi* at the beginning of the outbreak when Acid Quinine Hydrobromide was not available and when all the other drugs had failed. In certain cases some bad effects of Acaprin were noticed but were immediately treated with Suprarenin. One case in which the toxic symptoms threatened death due to cardiac weakness was treated with Refrin 10 c. c. injected subcutaneously and immediate improvement was noticed. This drug being costly could not be tried in many cases.

Complications. *Anaemia* was the common complication after recovery from the disease. In a wide sense there was reduction of blood and a fall in the numbers of red blood corpuscles. This was treated with various tonics in food particularly iron tonics and injection of normal saline solution to raise the quantity of blood. Required doses of Normal Saline for individuals were adjusted by starting at a low dose of 20 c. c. subcutaneously reaching the maximum of 100 c. c. twice daily. When the dose was sufficient the temperature would go up by a degree or two but would come down to normal within twenty-four hours. Some cases required

100 c.c. of Normal Saline twice daily without any reaction for about a week. Immediately the temperature started rising the doses were gradually reduced and when the cases reacted to a minimum dose of 20 c. c. the injections were stopped. This in particular has given excellent results in anaemia caused by Piroplasmosis. Even some of the chronic cases were successfully treated with this treatment in combination with tonics and special feeds.

Lumbago. Lumbago (Kumri) was a common sequel to this disease. The writer cannot give any particular reasons for it but alludes it to the general weakness of the lumbar muscles (as most of the animals were riding horses) in combination with the general metabolic disorders, general exhaustion and cardiac and circulatory weakness. The chief symptoms manifested were stiffness in movements, marked difficulty in turning and in backing, staggering gait and at times difficulty in rising also.

The most successful treatments found were those of injections of 10 c.c. of a 3 per cent. solution of Tonophosphan injected subcutaneously or 20 c.c. of a 5 per cent solution of Sodium Iodide given intravenously every alternate day. In most of the cases five injections were found to be sufficient but in a few cases, a second course of five more injections were required. The second course was started a week after the first course.

Another complication which was very commonly noticed was connected with the eye—such as Keratitis, Opacity of the cornea and an important but not commonly found one was Retinitis Pigmentosa.

Keratitis. As a sequel of Piroplasmosis, Keratitis was one of the commonest trouble which arose particularly during the period of Anaemia. This was probably due to general impairment of vitality. Therefore in debilitated subjects Keratitis in its various forms was a common complication. Lachrymation, Photophobia, and closure of eyelids were the early symptoms. On examination of the eyes, more or less dense opacity of the cornea was visible. It was usually diffused with no signs of injury to the eye and hence could not be localised.

The surface looked quite smooth and intact and no ulcer visible. The animals were put under treatment (local and general) and cent per cent. of the cases recovered. The line of treatment followed was antiseptic eye-washes followed by application of Unguentum Hydrargyri Oxidi Flavum.

Special attention to feeding was paid and Cod Liver Oil with plenty of green fodder was given. In certain cases administration of Potassium Iodide as intravenous injections was found necessary. The cases of complete opacity of the cornea took about four weeks to clear.

Retinitis Pigmentosa. A case of this disease was reported by an Officer who used the animal as his charger. The complaint was that the animal was not able to see the watering and feeding troughs at night and grabbed to feel them. The animal was immediately removed to the hospital and was kept under observation.

The history of the case was that the animal was treated for worms in December 1934 and passed a very large number of whip worms (*Oxyuris equi*). The animal was put on condition powder and improved in condition. In about January 1936 the animal was admitted to the hospital for Piroplasmosis and was successfully treated with Yellow Acid Quinine Hydrobromide. It was discharged in the month of February and worked satisfactorily till November of the same year when it was reported for night blindness.

On shifting the animal to the hospital it was examined and tested. There was slight dilatation of pupils and the animal was not able to see properly even during the day. Eserine solution was tried to contract the pupils but no change was seen except a little contraction. The animal showed no reaction to bright light. The State Ophthalmic Surgeon was therefore sent for and the eyes were examined with Ophthalmoscope. Before examining this case he was shown and allowed to examine normal eyes of some horses to give him an idea of the normal eye of a horse for a comparative study of this particular case. His diagnosis was "Retinitis Pigmentosa" which showed the following symptoms:—

Defective vision, particularly at night. This was due to defective nutrition. The examination of the vision showed that the pupils did not react to light and the Retina was studded with small jet black spots resembling spiders. The retinal veins also showed slight pigmentation in their course. The pigmented red spots which were near the veins looked anterior to them. From the number of these spots and their location it was inferred that the case was fairly an old one. There was no optic trophy and the disc was pale.

In this particular case the condition was ascribed to malnutrition as the animal had already suffered from a very bad infestation with worms followed by an attack of Piroplasmosis and hence was treated with balanced ration, including sufficient quantity of green lucerne and injection of Potassium Iodide one dram intravenously every alternate day. The animal improved within a fortnight and was discharged completely free from the trouble within a month. A second case of similar trouble was recorded in the month of August 1941. This was a hill pony about seven years of age, admitted to the hospital for Piroplasmosis. During the courses of the disease itself it showed similar symptoms, and was again shown to the

Ophthalmic Surgeon. This case also was cured with the same line of treatment. These two cases make one to suspect if the lowering of vitality could bring about these diseases as a complication of Piroplasmosis.

Oedematous Swellings. As a sequel of Piroplasmosis, in some cases, painful swellings occurred under the belly and dependent parts involving the sheath and legs also. These swellings gradually extended over the body. This was first thought to be due to the weakness of the heart and slackness of the liver but it never yielded to ordinary line of treatment. The swelling threatened to necrosis and had to be treated with Iodine and other allied absorbents. Hot treatment to the local parts induced pus formation and hence had to be stopped. At the beginning, the swellings were usually cold and painless and reduced easily with exercise but on rest the tendency was to extend with pain and heat. A few of these cases ended in Purpura Haemorrhagica probably due to the infection of wounds and they consequently died. In some of the recovered cases, swellings in the joints remained for a fairly long time with lameness but subsequently yielded to the application of Unguentum Hydrargyri Nigra and Iodine ointment.

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ARTIFICIAL INSEMINATION TO AID IMPROVEMENT OF CATTLE*

By

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The difficulty of procuring good sires in effecting improvement of cattle by selective breeding is very keenly felt; and in fact, it has been a serious handicap in speeding up production of improved cattle. Approved good bulls are only limited in number and they are not available for use on a wide and extensive area. To overcome this shortage, advantage should, I think, be taken of the experience of countries like Russia and Palestine where artificial insemination has been practised on a large scale with excellent results.

* Paper read at the Provincial Veterinary Conference, A.I.V.A., Madras Branch, held in April 1944.

Ordinarily one bull will serve 100 cows in a year; and it is usual to have two copulations on each occasion to ensure certainty of conception. Even then a 5 per cent failure is expected, leaving a successful service of 95 cows a year.

A stud bull is found normally to discharge about 4 c.c. of semen during a single service and, as indicated above, 8 c.c. of semen is spent on a single cow for the production of one calf. But if the artificial insemination method is practised, this 8 c.c. can be utilised to the fullest advantage. This is worked out in this way: the 8 c.c. of semen after collection by an artificial vagina is diluted to 40 c.c. with diluents like yolk buffer pabulum. Only one c.c. of such diluted semen is required to fertilize a cow. Thus 8 c.c. of semen can be utilized to fertilise 40 cows. At this rate in the course of a year 4000 cows can be fertilised with the ejaculated semen from one bull. Allowing a 50 per cent failure in the artificial insemination we can easily fertilise 2000 cows in a year or in the ratio of 1: 20 (normal service to artificial fertilisation).

It is not always possible to get a large number of cows in heat on a single day at one place as there are at the moment no co-operative breeding farms just as in Russia or America. So practical application of artificial insemination becomes difficult in this country and in order that this method should become useful, preservation of semen has to be resorted to enable transport to wider areas. An attempt has been made to determine the maximum period, of viability of the sperms and it is observed that semen can be preserved for 12 days under certain conditions (vide article published by me recently in the *I.V.J.*). Veterinary institutions can be made the inseminating centres as this is an easy job for all the veterinarians. By these means the services of a good sire can be utilised in a wider area than is possible at present.

It is therefore necessary to open semen collecting farms with good sires, from which place, semen could be collected and despatched to different institutions. By so doing, the difficulty of supplying breeding bulls is no longer paramount.

It could safely be concluded that with the limited number of sires now available and working on the lines of artificial insemination the breeding scheme cannot be a failure for want of sires and the breeding programme could thus be speeded up to expectations.

THE HOUSE DOG : ITS EDUCATION AND TRAINING

By

MAHADEVAN

Manners Outside the House

1. Before you attempt to take a puppy out for a walk, accustom him at home to a collar and chain.

- (a) Tie a small string, ribbon or anything else round his neck as a preliminary : it may or may not try to scratch it off. Once it has got accustomed to something round its neck, put a collar on, but don't chain it now.
- (b) After a day or two chain it at sleeping time to the spot where it usually sleeps.
- (c) When it barks to be let out, take it out on the chain, bring back and tie up : in a few days, it will get accustomed to collar and chain, and will not struggle when you put it on to take out for a walk.

2. When you feel certain, that your pup won't make you look silly, take him out on quiet roads for walks.

- (a) Heel ! The puppy should always follow on your left, with its nose close to your knee, pulling neither forward nor back. This is called, "Walking to heel".
- (b) The lead should be held short enough to keep the dog in the desired position; every time he pulls forward or lags behind, pull up smartly to proper position and say "Heel".
This is a tiresome exercise, but it should be taught. Though it is unnecessary for your dog to heel you at all places, you may find it necessary to keep him at heel at some places ; e.g. when there are poultry and sheep about, some dogs have an irrepressible desire to chase them. A dog that is taught to heel as a pup, will under such circumstances save you lot of worry.
- (c) It takes about a dozen lessons for an average dog to learn this exercise properly. Now, you can safely take him out without restraining him with chain or lead. It is only a few dogs that follow at heel in the manner desired at dog shows and obedience tests, but any dog will follow you fairly satisfactorily. For large and powerful breeds, this lesson is absolutely indispensable.

THE HOUSE DOG : ITS EDUCATION AND TRAINING 31

The writer has observed a great number of Great Danes in Calcutta, taking their masters for a walk. These noble animals, impatient of the slow human toddling, would be pulling and straining, and dragging their unfortunate keeper, a few feet behind them. One of these proud owners informed the writer that a friend of his had an even bigger dog, which required two servants to take it for a walk. You will be wondering whether such undisciplined brutes can be of any use. You are quite right ; they are of no use. On the contrary, they are liabilities.

In Germany, in obedience classes for Alsations, the highest marks are awarded for the following exercise :—

The dog chases a man who is running away; and when it is about to sink its fangs into his calf, the handler orders the dog back. The dog must come back *at once*, usually at a gallop. Anyone, who knows the Alsations' love of attacking, will realise how disciplined the dog should be to pass this test successfully. Many dogs do pass this test, which is to the credit of the trainers and the dogs.

So should your dog be : disciplined like a soldier either to attack or desist at your bidding. To make a puppy walk at heel is the first essential in instilling this obedience, and discipline. Though "heel" is taught at an early age, few dogs have the patience to walk at heel properly until an year old. All the same, the earlier the education begins, the better.

2. As a further development of this lesson, the dog should halt when you halt.

In obedience classes, the dog is expected to sit when the handler halts. The writers' experience in India shows that it is better to keep the dog standing. The road may be wet, and most often the place may have been spat upon with betel or tobacco juice. You can allow your dog to sit if you have no objection to the filth being transferred to the dog's tail, and quite often transferred to your clothes when it wags its tail.

To sit when you halt, looks spectacular, but it is not wise. In some countries, spitting on the sidewalk is an offence ; not in India.

(a) Once the lesson, "Heel" is well learnt, the dog easily runs behind cycle rickshaw, or gharry. Big dogs which require lot of exercise should be taught to run alongside bicycles. A servant can easily run it thus a few miles a day.

It has generally been observed that dogs that are sent out with servants for exercise get very little of it. The servant likes to sit and gossip with his cronies, and the dog takes no interest in the proceedings and is

frightfully bored. The kind owner often wonders why his dog is not so lively as the next man's.

3. When you have gained confidence in your dog's manners, take him to crowded places full of traffic. This is especially necessary for Alsatians, which if not properly trained, become nervous. A friend of the writer had a very good Alsatian puppy purchased from a renowned breeder. By the time it was eighteen months old, it became so nervous that when it met a stranger it hid itself under a bench or any other suitable furniture! It did this in its own home, and kept barking nervously all the time, and refused to shut up.

(a) When the puppy has got accustomed to strange noises and sights, teach it to observe the traffic before crossing the road. For lack of this simple lesson, many valuable dogs have been run over and killed. If dogs can be taught to lead blind men, you should surely be able to teach it to lead itself across a road. Whenever you desire to cross a road, stop; the dog which has already learnt to halt, when you halt, will also stop. If you stop sufficiently long the dog will realise, what it is that keeps you waiting. In a few lessons, the dog will observe by itself, the approaching traffic. Apart from your anxiety about your dog, it is dangerous for others to let your dog dash across the street. Most drivers of cars are considerate enough to avoid running over your pet, and accidents have happened in their efforts to avoid undisciplined dogs.

4. Never encourage your dog to fight with other dogs in the street. The other dog may be as valuable to some other person as yours is to you. A quiet dog is not necessarily a timid dog. A yapping bully is not necessarily a courageous fellow.

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IN THE REALM OF INDIAN VETERINARY MEDICINE

By

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Introduction. A successful practice of the so-called art of healing depends not only upon a thorough study of the gross anatomical structures and physiological functions of the various organs of the body, but also upon an intimate knowledge of the subtle histological changes and the chemical composition of the several tissue-forming elements, constituting the organs. What are considered pathological changes, are nothing but the resultant effects of corresponding morphological variations, in the histological

structures and chemical compositions of the tissues, which are either macroscopic or microscopic. All known systems of medicine are agreed, that the *sumnum bonum* of the several theories connected with disease production, and its prevention and treatment, is the tone of the tissues and its response to aggression either internal (idiopathic) or external (traumatic). Thus far remains the common platform for all systems of medicine. It is from here that advocates of the different systems go forth with their varying theories. There is the Naturopathy which proclaims that nature is the builder and repairer of all tissues, and no treatment need be made, except helping nature to adjust itself; then there is the Hydro-path, which advocates that water is the healer of all ailments, and that certain kinds of baths and massages are enough for the cure of diseases. Oxypathy comes next, which announces that oxygen and ozone are the panacea of all ills; then comes Chromopathy which propounds that the tissues are composed of seven colours, and that administration of irradiated colour treatment will cure all ailments; then there is the Homeopathy which comes out with its tissue remedies.

Principles of our Modern Medicine. In the midst of these several conflicting theories mentioned above, comes our modern day Allopathic medicine with its elaborate research laboratories and their experimental observations and findings. Medical and Veterinary research of the present day has extended in the material field, as far as the eyes can reach under the microscope, and a little further also in the ultra-microscopical field, as far as the filtrable and non-filtrable virus region. Beyond this region, research findings are very meagre. As already pointed out by me in the beginning of this article the basic principle of disease-production, and of its prevention and treatment, is the tone of the tissues, and its response to aggression, either from inside or outside. According to modern research scholars, there is the microbic, virus or other invasion on the one hand, and the tissue reaction to such invasion on the other. Attempts have been made to explain the process of this mutual struggle, for survival and existence of each one of these, by the several constructive theories:—viz., the theory of Vaughan, the immunity theories of Retention and Exhaustion, the Opsonic theory of Wright, the Macrophagic and microphagic theory of Metchinikoff, and his study of Chemotaxis; and Ehrlich's Humoural theory consisting of his three orders, viz., Toxins and Anti-toxins of the first order, the Agglutinins and Precipitins of the second order and Bacteriolysins and Cytolysins of the third order. To add to these, the Bacteriophagic theory is also coming into the field.

The findings of our present-day research scholars are the results of their experimental observations, on the macroscopic and microscopic variations of the histological structures of the tissues, as a result of

bacterial or other invasion. At the same time, it is acknowledged that the reaction of the tissues to the microbic or other invasion is not constant, but variable and conditional. In all protozoan as well as almost all diseases of major importance, such as Tuberculosis, etc., the healthy animals are reported to harbour the organisms in their non-pathogenic state, and act as carriers of infection to other animals, under normal healthy conditions. It is generally explained, that these organisms live a saprophytic non-pathogenic life under normal or healthy condition of their hosts, but become pathogenic, when the hosts become debilitated. To put it the other way, it can be said that the tissue response to the microbic or other attack, is not only varying and conditional, but also proportional to the other debilitating factors of the patient. The observations of our scholars, based as they are on such varying tissue reactions, are also liable to vary. What was considered true a decade back, is now found to vary. Under Foot and Mouth disease, which was considered to be running only one specific course, several types are now recognised. In Black quarter, unlike a decade back, different strains of the causal organism are now recognised. In the case of Haemorrhagic Septicaemia, the following passage in pages 100 and 101 of the 'Special Pathology and Therapeutics of the diseases of Domestic Animals' by Hutyra, Marek and Manninger is worthy of note :—

"Although contrary to the view described, Pasteurellosis cannot be regarded as a soil disease, there are observations which indicate that Pasteurella occurs widely under natural conditions, not in the open, however, but in the bodies of healthy animals, in which they live as saprophytes, in a non-virulent or moderately virulent form, especially in the upper air passages.

The development of Pasteurellosis in bacillus carries as a result of debilitating influences, accounts for the well-known experience, that the disease may appear in certain regions, without any apparent mode of introduction, and that in most cases, it is not transmitted from one animal to another etc."

Again in the field of Parasitology, we see how Schistosomes are going on being multiplied by the discovery of more and more new varieties.

It is thus seen that the theory of the microbic and parasitic invasion is varying from day to day, and that it is liable to vary still further, in the light of our modern-day experimental observations. There can be no doubt that, in its efforts to exterminate bacterial and parasitic diseases modern Medical and Veterinary science has achieved great success, by the use of prophylactic and curative sera and vaccines and parasitocidal agents. It has however been the case that, when dealing with widespread infec-

tions, this success has been only a temporary one; and there is reason to say that, in fact, modern science by such advancement has really added to its future difficulties, by stimulating the evolution of new types of bacteria and parasites immune from the effects of the vaccines, sera and other agents. It is often stated that, in the course of evolution, the fittest, the toughest and the most adaptable tend to survive while the weakest go to the wall. Apply this principle to the bacterial and parasitic group subjected to the actions of the remedial agents. A large number, perhaps the majority, may be destroyed; but a few may escape with little or no harmful effects from the action of such remedial agents. These survivors breed and a proportion of their offspring will enjoy a similar immunity and resistance to the remedies used by man to kill them. With each successive generation, the proportion of the remedy-proof bacteria and parasites increases, until in course of time, a new strain of bacteria and a variety of parasites are evolved which are able to resist the substances which were so deadly to their ancestors. One cannot reasonably deny, as to why this should not be a cause for the ever-increasing discoveries of new strains of bacteria and new kinds of parasites by Research scholars of to-day. In the face of such complicated, yet constructive theories, it is the aim of the author of this article to place before the Veterinary profession, the principles of Indigenous Veterinary medicine and to leave the profession to decide, if an investigation of this science will not at least improve, if not enrich our present day Veterinary knowledge, and aid us to overcome some of knotty theories like the above. It is felt certain that the investigation of this science will at least open a very wide field for research for our scholars of to-day. In this connection, we cannot but recall the wise words recently uttered by Mr. H. F. Knight, Advisor to His Excellency the Governor of Bombay, who, while declaring open on the 17th July 1941, the Rambilas Anandilal Podar Ayurvedic College, the first Government recognised institution for the study of Indigenous system of medicine in Bombay, said: "In these days, every science has to welcome strangers within its gates to test and prove them whether they be true or false, and if true to embody them in its own system—if necessary, rejecting them from that system such parts as will no longer stand the test. If a science fails to do so and adopts a policy of isolation and withdrawal from the stream of human progress, then its power of helping humanity inevitably decreases etc." This of course serves as a sufficient argument for me to put forth the claim for a study of the Indigenous Veterinary literature before the professional Veterinarians of to-day.

Basic Principles of Indian Veterinary Medicine

In common with all other systems of Medicine, the Indian medicine has certain basic principles of its own. To the Hindu, the universe "is not a mere fortuitous concourse of atoms, nor a puzzling labyrinth of purposeless

activities and inactivities, but a Cosmos capable of consistent explanation, an ordered sequence of cause and effect, a mighty whole of which human beings are just a part". To him the aim of man is one of a long continuous evolution of the soul from the lowest to the highest. To cope up with such evolution, the physical body has to withstand several kinds of obstacles and insuperable difficulties. And wise men of ancient days had found out various methods of investigating the real causes of these physical obstacles, and had tried to overcome them; and this branch of science they called the "Ayurveda" "Science of Life" or the Medical science. A real Indian physician does not therefore study medicine as an isolated entity in itself, but as a branch of evolution of the universe. To him, the conception of any living being is twofold, viz., the concrete or the gross and the abstract or the subtle. On the concrete side, every object in this world is supposed to be made up of the five primordial elements, viz., earth, water, fire, air and space; and on the abstract side, every object is being controlled by the three subtle forces or humours as they are called. It is important to note that the significance of the five elements and the three humours should be clearly understood before the Hindu system of medicine can be understood. Every science must have its technical terms. In the selection of such terms, care should be taken to see that the technical terms used are not in common use, likely to give other meanings. Unfortunately, whether it is due to the framers of the Hindu System of medicine in not having selected suitable technical names, or due to want of proper care on the part of the successive generations of practitioners, in not having given proper interpretations to those names, the terms used for the five primordial elements, viz., earth, water, fire, air and space, and for the three humours, viz., wind, bile and phlegm have been very much misunderstood. The names earth, water, fire, air and space are not the things that we see and feel around us, but represent only matter in its different stages of density. Just as the modern scientists have recognised matter in its three different stages of density, viz., solids, liquids and gases, so also the ancient Indians had recognised matter in its five stages of density, and designated them as above. There is a collective name for these five stages of matter called "Panchabhutas" or the five elements; and according to Hindu Science, the whole universe the movable and immovable, the mutable and the immutable, the visible and the invisible, all contained in it, are said to have their origin from these Panchabhutas, i.e., an admixture in certain proportion of matter in its five densities designated as the five Primordial elements mentioned above. There is nothing in this universe, that is not a consolidation of these five elements in some proportion or other. But the proportion in which these elements exist in one subject is not similar to that in any other. It is this inexplicable dissimilarity which constitutes a unique compound of each object that makes men, animals, and the countless mutable and immutable

articles in the world, with individual inequalities in each; and it is this wonderful dissimilarity again, that accounts for the fact that all objects in this world are different from each other, and no two things look alike.

Coming now to the three humours, viz., wind, bile and phlegm, the term "wind" used in the above, is not the air or the atmosphere that we breathe; so also bile is not the liver secretion or the contents of gall bladder; and phlegm also is not the coughed-out material of the body. Each one of these represents a certain specific, but a subtle force of its own. What is called the state of health, is supposed to be brought about by the proper co-ordination in suitable proportion of the five concrete elements, influenced by a correspondingly well-balanced correlation of the three humours. Correlation of these humours are twofold, viz., balanced or healthy, and adverse or vitiated. In the case of adverse correlation, it may be either excessive correlation, or absence of correlation on the part of any of these humours, either singly or combined. Such an adverse correlation manifests itself, in the form of a varying mal-coordination of the five concrete elements which, in its turn, brings about certain visible changes in the tissue; and this is considered to be the state of disease. It is because that every disease or ailment takes its origin, from the adverse or faulty correlation of any of these three humours, either singly or jointly, there is a common designation for these humours, viz., the "Thridosha" meaning the "Three faults". In the absence of a suitable expression in our Western Medicine to represent the significance of the three humouric forces, if the above word "Thridosha" can be understood as a common name given to all the functions of the tissues, viz., sustentive, correlative and generative, it will be nearer the truth. Thus the secret of correct diagnosis of a disease lies in finding out the exact degree of deviation from the natural proportion of the Thridosha or the three humouric forces, which brings about the disproportion of the five primordial elementary constituents of the tissues, and thus manifests itself in the form of disease.

As in the case of diseases, so also in the case of remedial agents, the Indian Materia Medica has been classified into drugs that exert specific influence on each of the three humours, individually and in their various combinations. Hence the secret of treating a disease resolves itself into choosing a remedy which, if utilized, will tend to bring back the natural proportion of the humouric forces, which, in its turn, will set right the disproportionate elements of the tissues and their disorganised functions and thus restore the state of health. Here ends the theoretical principles of the Indigenous medicine. In the midst of the several complex theories which are now coming up, as a result of modern research, the author is not in a position to claim any incontrovertibility or superiority of the Indigenous medical principles described above. It is enough to note that, in the

opinion of some eminent medical scholars, like Dr. Wise, Roxburgh, Captain C. Johnston Saint etc., these principles are complete by themselves. Here also, as in the case of Western medicine, the tone of the tissue and its response to aggression are the underlying factors of disease-production and its treatment, the only difference being, that in the Western medicine, the tissue resistance in the body is reported to be weakened directly by the invading microbes or their toxins; while in the indigenous medicine it is explained that the invading forces, by whatever name they are called, bring about a disturbed equilibrium in the body metabolism, which is designated as humoric disturbance and which, in turn, brings about some corresponding chemico-physiological changes in the tissues which are designated as the mal-coordination of the five primordial elements and thus weakens the tissue resistance in the body. It can thus be seen that the Indian theory is not importing anything new into the modern medical science. Like all the other theories of Vaughan, Metchintoff and Erlick, this is only another form of attempt to explain the reaction of tissues to outside aggression and in so doing, it only introduces two new intermediary factors of humeric disturbances and mal-coordination of the five primordial elements between the invading forces and the tissue reaction. Is it not the purpose of the author to dwell further in detail on the intricacies of the indigenous system. If it is conceded, that an investigation of the Indigenous Veterinary medicine is also one of the factors for the furtherance of our existing Veterinary knowledge, there can be no doubt that such investigation, to be really fruitful and productive of any useful and definite results, involves a knowledge of the Indigenous Veterinary literature, and must be conducted on the main principles of Indigenous treatment detailed in such literature. Many are the old, original and authentic authors on Indian Veterinary Science and copious is the information contained therein. Among such authors stand prominent the names of Salihotra, Palakapya, Rajeputra, Vaisampayana, Vyasa, Narada, Mrigacharma, Dinapathy, Brihaspathy, Sukra, Veerasena, Jayadattasuri, Nakula, Gana, Malladeva Pandita, Simhadatta, Nala, Jayadeva, Garga, Atreya, Parasara, Manu, Vatsya, King Indusena, King Bhoja, Sarangadhara, Someswara, Kautilya, Vaada, Basava mantri, Geervana Yuddhe Vikrama, Simmara Bhoopathi, Viswanath Vajpeyi, Dipankara and Rudra deva, etc. so far known. Each one of these authors has contributed much valuable information on Veterinary Science. Veterinarians who are really interested in a knowledge for all-round information on Veterinary science may feel surprised at the host of the several authors given above. It is not possible in the short space of this article to give details of the various works on Veterinary Science written by these authors. The author of this article, in the course of his tour in the several provinces and States of India in connection with his enquiry on the efficacy or otherwise of the Indigenous system of Veterinary

treatment, instituted by the Imperial Council of Agricultural Research came across many of the books written by the above authors, and all the information so gathered has been incorporated in detail in his report to the Imperial Council of Agricultural Research. Some of the works are available in print, while many are available only in old manuscript preserved in some of the long standing libraries in India. There is no knowing as to how long these old already crumbling manuscripts will keep. One thing alone can be definitely said. Copious and valuable is the information contained in these books, but as all such information is available only in the original Sanskrit literature, they all remain a sealed book to the professional Veterinarians of to-day. It will only be in the best interest of the profession to see that all the information already available in print are translated and made available to the profession and all those literature now remaining in manuscripts are transcribed, printed and then translated in English, so that a wide field for Veterinary investigation and research may be open for professional Veterinarians.

Conclusion

Criticism is always the touchstone of progress and it is the earnest wish of the author that readers should make an analytical study of the article and offer their unbiassed criticism. If, in the end, the author is able to create a yearning in the minds of his critics, for a study of the Indigenous Veterinary lore, he will feel himself more than compensated for his labours.

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Editorial

ONE THOUSAND CRORE SCHEME

"A plan for the development of Agriculture and Animal Husbandry in India involving a capital outlay of Rs. 1,000 Crores is suggested in a Memorandum prepared for the consideration of the Advisory Board of the Imperial Council of Agricultural Research. The Plan has been prepared by a Special Committee and has the immediate object of increasing production by 50 per cent in the next ten years and by 100 per cent in the next fifteen years". In these words, an announcement has been made for the development of Agriculture and Animal Husbandry in India. This is heartening news, indeed. For a long time we have been flooded with schemes for Post-war Reconstruction which were at once vague and nebulous; this is the first time that something definite and concrete has been drawn up. As is well known, the term Post-war Reconstruction is a misnomer as far as this country is concerned. It can apply only to those countries which had developed themselves and which, unfortunately, had been subjected to the ravages of this Great War. In those countries the problem is one of repairing the damages wrought by this terrible War and of rebuilding and reconstituting National Life on lines of modern conception of life. And, therefore, the term Post-war Reconstruction cannot apply to this country. Here there had not been any construction, to talk much of. As such, the talk about any reconstruction in this country would be absolutely meaningless. It must really be only one of development and making amends for the past neglect and for the past sins of commission and omission. We are therefore gratified to learn that this scheme is not going to be one of those schemes designed

for the post-war period. Explaining the scheme, Sir Pheroze M. Kharegat said this is not post-war planning, but one which had been taken in hand in connection with the Grow More Food campaign and that it will merge in course of time with the Post-war Plans for general betterment.

The aim of the plan is, to use again the words of Sir Pheroze Kharegat, enough food of the right kind for every individual and a higher standard of living for all. The plan suggests an all-round increase in the production of cereals, pulses, fats, oils, vegetables and milk. Realising the nutritive value of milk and its present very low intake by the general population, provision has been made for a 300 per cent increase in milk production: and as regards Animal Husbandry, the methods of cattle improvement under the headings, feeding, breeding and methods of disease control have been suggested. It is also explained in the memorandum that no complete scheme is put forward, but only suggestions as to the lines along which work should be undertaken mainly by the Province. This is a step in the right direction and we are glad that no hard, cut and dry plan is framed for adoption all over the country. Problems vary from Province to Province and it is right to leave it to the authorities in the particular area to adopt their own solutions and plans within the ambit of the scheme.

We take this opportunity of appealing to the members of the profession in the various Provinces to revive their Associations, take stock of the existing conditions in their respective jurisdictions, and formulate their plans of development of Animal Husbandry without any delay. A solemn and heavy duty lies on the All-India Veterinary Association in this matter. Problems of great import problems affecting the economic conditions of the country and problems affecting the livestock of the land are being considered in the midst of the great stress of War and it should not be said of the Association later on that it failed the country at a very important stage of its life. It should organise immediately gatherings of professional men in different parts of the country and arrange for drafting out plans and schemes for the development of Animal Husbandry suited to the different parts of the country.



Clinical Articles

NASAL GRANULOMA—ITS TREATMENT UNDER FIELD CONDITIONS

By

B. MOHAN RAO,

Touring Veterinary Assistant Surgeon, Kovvur, Madras

It is not always possible for a Touring Veterinary Assistant Surgeon to adopt the usual six-day method of treating the disease with intravenous injections of Tartar Emetic. So an intermittent method of treating the disease by giving the injections every 2nd or 3rd day was carried out as follows:—

A batch of six animals in a village were taken up for treatment. All of them showed clear symptoms of the disease—growths in the nasal cavities, mucopurulent discharge, loud snoring, etc. Specimens from two of the cases were sent for microscopical examination and were confirmed as one of *S. nasalis* infection. All the animals were of medium size weighing about 500 lbs. each.

21-8-43. First injection of Tartar Emetic 10 grs. in 20 c.c. distilled water was given intravenously to each animal. This was repeated on 24-8-43 and 29-8-43. As no improvement was noticed, a fourth injection was given on 9-9-43 with 13 grs. of Tartar Emetic in 20 c.c. of water. This was repeated on 17-9-43 as there was no improvement. The examination of the growth was still positive for *S. nasalis*.

The village was visited on 20-10-43 to see the condition of the animals. All the symptoms recorded originally had subsided and the animals were healthy. Hence the treatment was stopped.

Ryots of the village have been instructed to disinfect the village pond by adding one ounce of Copper Sulphate for every 7800 gallons of water. They were also instructed to repeat the process every year after rainy season.

Remarks:—Slight swelling of the neck at the seat of injection and its surrounding parts was seen in two cases but it subsided with the application of liniment and fomentation. One animal which was said to be dull and off feed after the fourth injection was successfully treated with Tannic Acid, Mag. Sulph., Nux Vomica and jaggery.

Conclusion :—It has been an established fact that treatment of Nasal Granuloma with intravenous injections of Tartar Emetic results in a definite cure. But it appears from this experiment that treatment can be discontinued after the fifth injection even though no improvement was observed for the time being. A month or more of the last injection, as was shown in these cases, all the symptoms disappear.

Mr. R. N. Naik, G.B.V.C., also has stated in the *Indian Journal of Veterinary Science and Animal Husbandry*, June 1942, that, when results were recorded 64 days after the treatment, 68 were found to be cured out of the 77 treated with Tartar Emetic.

I am very grateful to the District Veterinary Officer, Rajahmundry, for help rendered in recording this experiment.

RABIES IN A COCKER SPANIEL

By

D. ABDUL HAFFIZ, G.M.V.C.,
Veterinary Assistant Surgeon, Vizagapatam

Subject :—Cocker Spaniel, aged 9 months, fair in condition.

History :—The patient had distemper from 22nd September 1943 to 26th September 1943 with all the typical symptoms of the disease, and was discharged cured on 29th September 1943. On the 1st October 1943, the owner informed me that the animal was alright and asked me if anything further was to be done and I advised him that, nothing in the form of medicine was necessary except that meat need not be forced in. On the fifth night at 11 p.m., the owner woke me up saying that the dog's condition was precarious and its behaviour strange for about an hour.

Symptoms :—The bitch was restless moving round and round on its left side, there was slight salivation, and mucous membrane injected. Periodical epileptic fits were noticed with involuntary movements. Temperature was 104.8°F. pulse and respirations were hurried and accelerated. Eyes looked normal.

Treatment :—Relieved constipation by glycerine enema and injected 100 c.c. of normal saline with 1 c.c. of liq. Adrenaline subcutaneously. The bitch looked slightly better and the circling movements stopped. The animal was allowed to rest.

URO-LITHIASIS IN BOVINES

The next morning temperature persisted. The patient showed similar symptoms and threatened paralysis. In addition, it exhibited an extraordinary symptom of *pushing forward* described by Nicolas in 3 dogs (taking a leap in the air in a forward direction as if in fright), which was observed twice for the first time. Blood smears revealed no organisms.

The case was treated symptomatically and in addition, Vitamin B-1 was given both orally and intravenously. Brands Essence, Glucose D in milk were given every two hours as diet.

On the sixth evening, the patient was fairly bright moving about responding to call and was considered better. On the 7th October the temperature persisted and the animal developed paralysis of both hind legs and was in a state of deep coma. Treatment was repeated but the patient died at 2 p.m., the same day i. e., 7-10-43.

The brain was removed and sent to the Pasteur Institute, Coonoor. It was declared positive for Rabies.

Remarks :—Strange features of this case were that it was from the beginning till death, running a high temperature even after the paralysis had developed. There was no irritability, excitement, difficulty in breathing or swallowing, periods of unconsciousness, dilated pupils, bloodshot eyes and glaring looks. The patient showed none of the symptoms of rabies except the forward push (Nicolas) and moving in circles both of which are not uncommon with the nervous symptoms of distemper. Depending upon the single symptom (Push forward) and to clear my doubt the brain was sent for examination. It is therefore desirable in all cases of suspicious deaths to get the brain examined for rabies.

URO-LITHIASIS IN BOVINES

By

M. V. SUBBARAYUDU, G.M.V.C.,
Veterinary Assistant Surgeon, Guntur.

Cases of Uro-lithiasis are fairly common in Guntur and the following will be found interesting.

Subject :—A bullock, aged about eight years, admitted into the hospital on 1-9-43 with the history that it was struggling with pain from that morning, lying down and getting up, that it had passed no urine and that the bowels too had not moved. The normal supply of water for the animal was from a well.

Symptoms:—Colicky pains, frequent lying down and getting up, kicking of the hind leg while lying down and stamping while standing, frequent attempts at urination, but to no purpose, anxious expression, off feed, suspended rumination, temperature 102°F.; arching the back and straining, rectal mucus membrane, congested and slightly protruded.

Diagnosis:—Rectal exploration revealed a distended bladder. Palpating along the course of the penis, a prominence could be felt in front of the scrotum. The case was therefore diagnosed as one of Urinary calculus.

Operation:—The animal was cast carefully and secured with both hind limbs well drawn backwards with a rope, and the forelegs drawn forwards, and an incision about 4" long was made longitudinally over the skin. Through this incision, the penis was brought out. Directly incising over the calculus, it was removed. The part in front of the scrotum on the calculus was cleaned. No sooner was the stone removed than the urine was forced out with a jerk and continued to flow for about 5 minutes. When the bladder was re-examined it was found to be empty. After painting iodine, the skin wound was sutured leaving the urethral opening as it was and the animal was allowed to get up. The calculus was about the size of a marble with a golden line. Internally administered two ounces of Sodium Chloride and 2 drachms of Hexamine. Next day, the animal passed urine partly through the natural opening and partly through the sutured wound and started eating grass and ruminating. It was treated for 10 days when the owner took it home and treated it there.

After two months, the owner informed me that the animal was well but was passing urine through the artificial external opening. In other respects the animal was well and was also working.

Case No. 2. A bull aged 3 years, which was also given well water for drinking, was admitted on 24-12-43. In this animal, the obstruction was felt at the meatus urinaries which was highly congested and slightly necrosed. By gently drawing out the penis, the calculus was removed with a forceps when the urine flowed out with great force. This calculus is conical in shape and is gritty—not smooth and shining as in the previous case No. 1. With ordinary treatment the bull recovered and discharged cured.

Case Nos. 3 & 4. A he-buffalo, aged 6 years, and a young bull 2 years old. In these two cases the calculi were removed from the urethra above the scrotum at the first bend of the penis, but as there was rupture of the bladder before their admission, the removal of the calculi did not save their lives. By puncturing the abdomen large quantities of fluid were withdrawn, but this operation only prolonged their lives for a few days.

Case No. 5. In this case which was a bull, urine had extravated into the surrounding tissues along the lower part of the abdomen. The calculus could not be located. Punctures here and there were made into the oedematous swelling. In 10 days' time the tissue sloughed leaving an open raw cavity through which urine freely came out. This state continued for about 10 days. The case is still kept as an in-patient and its result is under observation. But from past experience, I can say that all will be well with the animal as long as the skin wound is kept patent.

Although, there have been 8 cases of this complaint in bovines, it is interesting to note that no cases of sheep from this complaint have been recorded so far.

A SUCCESSFUL CASE OF URETHROTOMY IN A BUFFALO

By

B. SAMBAMURTI, B.V.SC.,
Veterinary Assistant Surgeon, Razole

Subject:—A he-buffalo, aged two years, was brought to the hospital on 11-4-43 with a history that it had not been passing urine for a week.

Symptoms:—On examination, the whole sheath from the level of the scrotum to the prepuce including the penis was swollen and gangrenous. The animal was uneasy, "stamping and padding with his hind feet, kicking at his belly and whisking his tail" and straining to pass urine. The condition of the animal was poor.

Diagnosis:—The case was diagnosed to be one of uro-lithiasis and ischial urethrotomy was decided upon as "the promptest method of affording relief". The gangrenous condition of the sheath was probably due to subcutaneous extravasation of urine from impaction of urethra.

The Operation:—The site of the operation (at the ischial arch) was prepared, incision made and the urethra opened after blunt dissection of the subjacent tissues. Immediately urine rushed forth in a jet. The free borders of the urethra were then sutured to the penis fixing it to the neighbouring tissues thus retaining opening patent. The gangrenous portion of the sheath including the penis near its end was removed together with a portion of the affected abdominal skin and then antiseptically dressed.

Post operative care:—The operation wound was daily dressed antiseptically for a week, when it healed up without any post operative

sequelae. The flow of urine was free and easy. The abdominal wound was daily dressed afterwards for nearly one and a half months, when it healed, and the animal discharged cured.

Discussion :—The possible cause of urinary obstruction in this case as can be judged from the history of the case was—Urolithiasis, located probably at the sigmoid curve—perhaps also the cause of the rupture of the urethra, gangrenous condition of the penis and sheath. After operation no calculi escaped from the urethral opening which was of course very high up.

Cases of urethral obstructions are supposed to be very grave since, although the operation may be successful in as far as relieving cystic distention, the post operative sequelae of subcutaneous infiltration of urine etc., presents a serious handicap.

The location of the point of urethral obstruction seems to have a bearing on obviating the chances of urine-infiltration. The location of the urethral opening just at the ischial curve facilitates the transmission of waves set in by the contractions of the muscular neck of the bladder in the out-flowing urine, such that the urine is driven under pressure and instead of dribbling and escaping in a spread outflow over the tissues, it falls in a small jet sufficient enough to cause the urine to fall outside. This was observed in this case, for the one and a half months it attended the hospital for dressing of the abdominal wound.

Conclusion :—The location of the urethral opening in ischial urethrotomy at the ischial curve, in such way as to afford a straight course for the passage of urine, may obviate the chances of urine infiltration by facilitating the urine to be passed under pressure and in a jet sufficient enough to fall outside the operation wound.

A NOTE ON CHRONIC LUXATION OF PATELLA AMONG BOVINES WITH SPECIAL REFERENCE TO ITS AETIOLOGY*

By

M. RAMAKRISHNA PILLAI, G.M.V.C.,
Veterinary Assistant Surgeon, Hosur Cattle Farm.

Introduction :—Chronic luxation of Patella among bovines is a common affection throughout India. Though the condition is not so serious as to endanger the life of the animal, the unsightly character of the malady is such as to reduce its economic value to a considerable extent. This fact

* Paper presented to the Provincial Veterinary Conference of the A.I.V.A., Madras Branch, held at Madras in April 1944.

has been realised both by the owner and the Veterinary Practitioner long ago and it is nearly two decades since a fairly successful curative remedy has been evolved by the premier worker, Rao K. S. P. (1925). After the publication by him of his results in the *Indian Veterinary Journal*, a number of other workers followed his method, with the result, that it has gained so wide a popularity that it is practised almost throughout the whole of India to-day. Although this subject has attracted greater attention in recent years and good reviews regarding the same on the treatment side are already available, Sankaran, K. S. B. (1927); Parmash, C. (1929); Ramiah, B. (1930), the aetiology of this queer derangement still remains unsolved. Many of the previous workers appear to have confined their attention mostly to the curative side and opinions expressed on the causation of the condition are often varied and mostly hypothetical. Thus, while there appears to be a good amount of speculation among the Veterinarians as to the probable cause of this condition, the author with a view to coming to definite conclusions based on actual findings, has collected at the Veterinary Hospital, Madanapalle, for a period of two years (from 1940 to 1942) such relevant clinical data as could be brought to bear upon the solution of this intricate problem. An attempt is also made in this paper to make a study of the reactions after treatment, at some detail, as regards its duration in the different animals and the relation it has to the age of the animal and curing of the condition. Though the main intention of this note is to deal with the aetiological aspect of the question, mention is however made about other aspects of the disease so that one can have a comprehensive survey of the subject.

Definition :—Chronic luxation of Patella may be defined as a temporary displacement of Patella from its normal size during the act of progression and characterised by dragging and spasmodic jerkey movements of one or both hind limbs for a period ranging from half to fifteen minutes—the duration depending upon the severity of the affection.

Animals affected :—The affection occurs mostly among working animals. Cattle are more commonly affected than buffaloes. Among cattle, bulls and bullocks are the worst sufferers.

Symptoms :—The condition starts in the form of an occasional jerk of the affected limb which is rather difficult to make out in the beginning. In the initial stages the jerks are confined to only one or two steps. But later on they increase in number and may extend up to fifteen to twenty steps. In very chronic cases, it is accompanied by the dragging of the limb and it would take about twelve to fifteen minutes for the limb to regain its normal position. When once the limb is put in action and the animal takes a few steps, the jerk disappears, but appears again when the animal is rested and put to work.

Treatment :—As it is opined that the affection occurs as a result of relaxation of the binding ligaments of the Patella, liquor iodi mitis was

injected in doses of 5 to 7 c.c. into the femoro patellar articulation with a view to setting up artificial inflammation and thereby to restore the ligaments to their original tones. The reactions noticed as a result of this injection are given in table II.

Indications for the insertion of the needle :—Since untoward results are not uncommon in a small percentage of cases following the injection, absolute care is necessary in the insertion of the needle.

A site is selected about three inches posterior to the point of the stifle, either internally or externally,—external preferable—and the needle is inserted at this point where there is also the femuro patellar groove. Immobilisation of the limb at this juncture is an essential factor as it is then, that injuries to the articular surfaces of bones such as pricks and scratches that are responsible for the subsequent untoward happenings, occur. The needle has just to enter the joint capsule, but not very deep as to pump out the synovia, for in such cases the reaction has been noticed to be very severe.

Table No. I

Statement showing the details of animals treated for chronic luxation of patella at the Veterinary Hospital, Madanapalle from 1940—1942.

Kind of animal.	Age of occurrence					No. of limbs affected			Whether working or non-working		
	Under 1 year.	1 to 2 years.	2 to 3 years.	3 to 4 years.	Over 4 years.	Total.	No. affected with one leg.	No. affected with both legs.	Total.	No. of working animals.	No. of non-working animals.
Bulls	...	2	72	8	...	82	49	33	82	77	5
Bullocks	...	...	86	62	73	221	145	76	221	221	...
Cows	...	...	9	6	6	21	21	...	21	21	...
Heifers	...	1	6	...	...	7	4	3	7	4	3
She buffaloes	...	...	1	...	1	2	1	1	2	...	2
Total	...	3	174	76	80	333	220	113	333	323	10

On the whole 333 animals were treated of which 82 were bulls, 221 bullocks, 21 cows, 7 heifer calves and 2 she buffaloes. When classified according to age, 3 were from one to two years, 174 two to three years, 76 three to four years and 80 over four years. From this it would appear that the worst sufferers are between the ages of two or three years. Excepting 10 animals, all the rest belonged to the working lot.

The affection of one leg has been observed in 221 cases, out of the total of 333 treated and as compared to those cases affected with both legs the occurrence is reckoned to be double.

Table No. II

Table No. II gives the results of treatment with reference to the age of the animal and the duration of reaction as observed in 179 animals. Since animals were coming for treatment from far and near it was not possible to note the reaction and record the results in all the 333 cases treated. Hence, the results of only those 179 cases wherein the reactions were studied are given.

From this statement it is seen that the period of reaction varied from one to four weeks and over according to the age of the animals. The duration of reaction seems to have some bearing on the age of the animal treated, i.e., the younger the animal, the shorter the duration, the older the animal, the longer the reaction. Thus we find that out of 16 animals reacted within one week, ten were under three years, while only six were over that age. The nine animals that reacted over 4 weeks were all aged ones, over 4 years. Even among those animals that reacted between 1 and 4 weeks, this fact is noticed. For instance, out of 63 animals that reacted between 1 and 2 weeks, 42 were young stock of under 3 years and only 21 were over that age; whereas, out of 73 animals that reacted between 2 and 3 weeks, only 26 were young stock (under three years) and all the remaining 47 were adult ones (over 3 years).

When we next examine as to what bearing the duration of the reaction has on the cure of the affection, we find, that out of the 14 failures 10 were found among the reactors within one week, 2 among the reactors between 1 and 2 weeks, 1 among the reactors between 2 and 3 weeks and 1 among the reactors over four weeks. From this it is clear that the highest number of failures were among those that had a very short period of reaction i.e., within one week. Out of the fourteen failures by the first injection as many as 13 got cured by the second injection; but the remaining one which was a bullock aged about 8 years, developed chronic swelling and lameness suffered for about 7 months and finally died of the weakness and emaciation.

52
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TABLE No. II
Statement showing the results of treatment with reference to the age of the animal and the duration of reaction as observed in 179 animals.

Age of the animals	Reaction under one week				Reaction between 1-2 weeks				Reaction between 2-3 weeks				Reaction between 3-4 weeks				Reaction over 4 weeks				Total	Remarks
	No. cured by the 1st injection	No. wherein recurrence took place after 6 months to one year and cured by the 2nd injection	No. which did not respond to 1st injection but cured by 2nd injection	No. which did not respond to even 2nd injection	No. cured by the 1st injection	No. wherein recurrence took place after 6 months to one year and cured by the 2nd injection	No. which did not respond to 1st injection but cured by 2nd injection	No. which did not respond to even 2nd injection	No. cured by the 1st injection	No. wherein recurrence took place after 6 months to one year and cured by the 2nd injection	No. which did not respond to 1st injection but cured by 2nd injection	No. which did not respond to even 2nd injection	No. cured by the 1st injection	No. wherein recurrence took place after 6 months to one year and cured by the 2nd injection	No. which did not respond to 1st injection but cured by 2nd injection	No. which did not respond to even 2nd injection	No. cured by the 1st injection	No. wherein recurrence took place after 6 months to one year and cured by the 2nd injection	No. which did not respond to 1st injection but cured by 2nd injection	No. which did not respond to even 2nd injection		
1 to 2 years	2				42	2															2	*The animal which was a bullock aged about 8 years suffered for about 7 months due to chronic swelling and lameness and died of weakness and emaciation
2 to 3 years	2		6		15																78	
3 to 4 years	2		2						26	40											60	
over 4 years					4				6								8			1	39	
Total	6		10		61	2			72	1			18				8			1	179	

Aetiology:—In attributing causes for this affection various factors have been repeatedly suggested. Rao K. S. P. (1925) observes that it is an affection mostly of working animals, but does not venture to say what exactly is the cause of this condition. Rao M. A. (1925) (quoted by the above author) seems to be of opinion that the condition is due to the tethering of calves by the hind limbs. If this be so, there are places in southern districts of this presidency where tethering is done to the forelimbs of calves and where this condition has been noticed to be equally common. Parmash (1929) and Chaudhuri G. N. (1931) are of opinion that this malady may be of nervous origin. The fact that this condition is more commonly found in one particular class of animals, seems to go a long way against this theory. Sankaran K. S. B. (1927) seems to be cautious like Prakasa Rao and only mentions that the condition affects the stifle, mostly the femoro patellar articulation, but does not commit himself to any length regarding the aetiology.

Raghavan T. (unpublished) is inclined to think that heredity may play a major part in this affection. Enquiries made of the cattle owners who have reared the animals in their homes regarding the cause of this affection revealed that the parents of each animals have not been known to have suffered from this at any time.

Again, there are others, who attribute the affection to such factors as individual susceptibility and bodily confirmation, environmental influence and climatic variations. That some animals may have from birth a susceptibility to this, by virtue of their confirmation is unlikely because this affection is not so commonly met with in milch cattle, young calves and other non-working animals. The presence of the disease in all parts of this presidency—both in dry and wet areas red and black soils and hills and plains goes to prove beyond doubt, that neither environmental factors nor climatic influences have any bearing on the problem.

From a study of table No. I it is seen that the affection is almost confined though not purely to working animals. Out of 333 animals treated, as many as 323 were of the working lot, the percentage being nearly 97. So it is quite evident that work has something to do with the affection. Then naturally the next question is whether any particular kind of work has a bearing on the subject. From enquiries made of the owners it was seen, that the affection was uniformly occurring in all kinds of animals irrespective of the nature of work they were doing—whether water drawing, carting or ploughing.

When we next examined as to what kind of animal among the working lot suffer most the statement reveals, that out of the total of 333 treated, 3 were between the ages of one and two years, 174 two and three years, 76

three, to four years and 80 over four years. In the case of those animals aged over three years, when enquiries were made of the owners regarding the probable age of occurrence, they invariably say that they were purchased with the affection and that they could not tell how long the condition had existed. In the absence of any definite information to the contrary, it will not be wrong to conclude that even among the animals over three years some, or even a fair percentage of them might have got the affection when they were between the ages of two and three years, because, the history of 174 animals (between the ages of 2 and 3 years) has revealed, that in all these animals, the affection started either immediately or a few days after the first time they were put to work. Further it is an established fact, that in the whole presidency of Madras, young bulls are castrated and broken for work when they are about 2 to 2½ years old (i.e.) just when they have out the first two permanent central incisors.

In the presence of the above findings, the only possible conclusion we can arrive at is that when young animals (bulls and bullocks) are put to heavy work for the first time, the affection usually occurs. This may be in all probability due to the undue strain brought about by heavy work on the tender and immature ligaments of the femoro-patellar articulation culminating in consequent dislocation of the bone.

Findings

1. Chronic luxation of patella is an affection mostly met with among working animals.
2. Bulls and bullocks under 3 years are affected in larger numbers than animals of other ages.
3. The use of liquor iodi mitis in the above affection still continues to claim beneficial results.
4. The duration of reaction seems to be directly proportional to the age of the animals treated—the younger animals having a shorter duration and the older ones longer duration of reaction.
5. Failures by first injection were more common among those animals which had reaction for about one week or less.
6. Heredity, bodily confirmation, and environmental factors appear to have no influence over the causation of this condition.
7. The cause of this affection seems to be due to young animals being put to heavy work when they are within 3 years of age.

Conclusion:—The percentage of this affection can be considerably reduced if bulls and bullocks are not put to heavy work before they are at least 3½ years old.

Acknowledgments.

The author is indebted to Mr. T. J. Hurley, Director of Veterinary Services, Madras, for his free discussion and useful suggestion on the subject during the inspection of the Veterinary Hospital, Madanapalle and to Mr. T. Raghavan, the then District Veterinary Officer, Madanapalle, for the main hints and broad outlines on which this inquiry was conducted. His grateful thanks are due to Mr. T. Vinayaka Mudaliar, Livestock Development Officer and Mr. I. D. Mantramurthi, Superintendent, both of the Hosur Cattle Farm, for their valuable help in the preparation of this paper.

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CHRONIC LUXATION OF PATELLA IN CATTLE—AN INVESTIGATION

By

MUHAMMAD RAHIMUDDIN, G.M.V.O., P.G. (EDIN.)

District Veterinary Officer, Vizagapatam

This condition is a common sight in the cattle of this district. Cows and bullocks are affected more than the buffaloes. Male and female animals are equally affected. The disease was not seen in young stock, except in a very few cases. The specific cause of the affection is not known.

An Ongole Cross-bred cow, aged, having both the legs badly affected but otherwise in fair condition was purchased. On 4-9-1943, 10 c.c. Liqr. Iodine were injected in the right external femur patellar groove without puncturing the synovial bursa. There was no reaction of any kind, such as inflammation of the joint, except that the cow was a bit dull next day after the injection. The jerking action of the limb was less on the 5th day (9-9-1943) and completely disappeared from the sixth day but slightly

reappeared on the tenth day (14-9-43) and developed fully by the 22nd day (26-9-43).

A second dose of Liqr. Iodine 15 c.c. was injected in the same place on 1-10-43; this time after puncturing the capsule on 2-10-43, there was slight inflammation present, i.e., the joint was hot and swollen and the animal could not move freely. Nothing was done except fomentation twice a day. On 3-10-43, jerking action was less and from 4-10-43 to 4-2-44 the movement of the limb was normal. However on 1-11-43, a third dose of Liqr. Iodine 10 c.c. was injected into the joint. This did not show any local reaction, except the animal was a bit dull on that day. In the course of the investigation it was noticed that the muscles of the right hip and thigh were getting gradually atrophied. The affected parts were blistered and the muscles became normal in course of time.

The left leg was not at all treated. It was left as a "control" to see, if proper feeding could make it alright. But it did not. The animal was given daily straw, green grass and concentrates required for a dry cow. She was also given sterilized bone meal, at the rate of 2 ounces per day for three months. All these helped her only to improve the general condition without affecting the luxation of the left patella.

During the course of investigation, I heard from villagers, that administration of $\frac{1}{4}$ tola of Opium caused a temporary cure for about a week and helped the owner of an affected animal to find a better sale for it. To this $\frac{1}{4}$ tola mixed with jaggery was fed to the cow under the experiment on 17-10-43; there was no benefit and hence another $\frac{1}{4}$ tola was fed on 18-10-43. This also had no desired effect.

The cow was slaughtered on 4-2-44, i.e., nearly 5 months after treatment, and her two patella joints were sent to the Principal, Madras Veterinary College for dissection to find out the difference between a treated and untreated joint. Another patella-joint from a different cow was also sent for comparative study. The following is a copy of the Principal's report on the dissection of the three joints:

"Dissection report on the three femoro-patellar joints—two left (not treated) and one right (treated).

D. & S. S. No. 3/43-44.

(1) Left (large sized—not treated):—

It is a case showing upward and outward fixation of the patella. The middle and internal straight and the internal lateral femoro-patellar ligaments were found overstretched and therefore elongated. The internal straight ligament of the patella was found hooked on to the upper extremity

of the internal lip of the femoral trochlea. The patella had gone up completely away from the trochlea riding over the external lip of the trochlea and was lodged about an inch above it. The external lateral femoro-patellar ligament was found relaxed. The articular surfaces of the patella and the femoral trochlea were normal.

D. & S. S. No. 4/43-44.

(2) Left (small sized—not treated):—

This joint does not present the luxation of the patella. The position of the patella on the trochlea, the two lateral femoro-patellar, the femoro-patellar capsule and the three straight ligaments of the patella and the articular surfaces of the bones of this joint were all found to be normal.

D. & S. S. No. 5/43-44.

(3) Right (large sized—treated):—

Though this is also an upward and outward dislocation of the patella it differed from No. 1 above in this, that the lower third of the patella was still found on the femoral-trochlea while the upper two-thirds had ridden over the external lip and was lodged about an inch above it.

The middle and internal straight and the internal lateral femoro-patellar ligaments were found overstretched and elongated.

Note:—The internal straight ligament was not so overstretched in this case (as in No. 1) as to be hooked on to the upper extremity of the internal lip of the femoral trochlea.

The external lateral femoro-patellar ligament was found slightly relaxed. The femoro-patellar capsule and the three straight ligaments of the patella were found very much thickened due to the addition of the large amount of new fibrous tissue. The three straight ligaments were found closely adherent by their deep faces to the femoro-patellar capsule.

Most of the internal aspect of the internal lip and the antero-inferior part of the external lip of the femoral trochlea showed ulceration of the articular cartilage and the articular surface.

The usual upward pouching of the capsular ligament was considerably reduced due to its thickened condition.

Note:—This joint is said to have been treated and the lameness to have disappeared but considering the extensive lesions found with reference to the articular surfaces of the two bones and the ligaments about it, it is inconceivable how the lameness could have disappeared."

Conclusion:—The concluding note of the Principal, Madras Veterinary College, is very interesting. It is difficult, indeed, to explain how the luxation disappeared, as it definitely did, with such retentive lesions in the joint.

Summary:—1. Chronic Luxation of Patella in bovines is largely prevalent in these parts.

2. Both male and female species get the affection.
3. Buffaloes are less susceptible and young calves are much less susceptible.
4. Injecting Liqr. Iodine 10 to 15 c.c. into the affected joint, makes the lameness disappear, even though the lesions were present.
5. The various ligaments of the affected femero-patellar joints had become over-stretched and elongated.
6. Feeding the affected animal with balanced ration and mineral mixture did not cure the disease.
7. The condition may be due to hereditary as I have noticed in the Live-stock Research Station, Hosur Cattle Farm, that a young calf of about 8 or 10 months old of a Scindhi or a Cross-bred cow (which I did not remember) had developed the disease, i.e. both the mother and the offspring had luxation of patella.
8. Considering a large number of animals affected a thorough research of the disease towards the prevention is desirable.

IMPACTION OF THE COLON IN A ZEBRA

By

M. MAQSOOD, L.V.P. (HONS.),
Demonstrator, Punjab Veterinary College, Lahore.

The subject was a female Zebra, age about 24 years, the property of the Zoological Garden, Lahore.

History:—The history of the case as narrated by the Curator of the Zoological Garden, Lahore, was that she did not take any food in the evening of the 26th April, 1944 and began to look frequently round at the flanks. The following day the respiration became somewhat laboured and she occasionally stretched herself as if to urinate but in vain. At about

11 a.m., her condition became worse and she off and on kicked forward at the abdomen, laid down, rolled about recklessly and got up in quick succession. Ultimately she laid down, struggled for her life and unfortunately died within about an hour.

About six months previously, she twice suffered from similar trouble and the disease was diagnosed as Impaction of the Pelvic Flexur of the large Colon. With proper treatment she was cured.

Post-mortem Examination:—The carcass was forwarded to the Laboratory section of the Punjab Veterinary College, Lahore, for post-mortem examination on the 27th April 1944.

The carcass was in good condition and the mucous membranes were congested. On examination of the large colon it was noticed that its pelvic flexur was markedly distended and this distension was due to the accumulation of undigested coarse foodstuff, which was about the size of a cocoanut. The mucous membranes had a bran like appearance due to the necrosed epithelial covering and was also studded with numerous petechiae and haemorrhagic patches. Numerous petechiae were also seen on the mucous membrane of the remaining large intestine. The remaining abdominal organs found were to be practically normal. Both the lungs were slightly congested and the heart appeared to be normal.

Discussion:—Defective mastication, reduced gastro-intestinal secretions and sluggish intestinal peristalsis, due to old age, probably led to the accumulation of the coarse foodstuff in the narrow pelvic flexor of the colon.

Correspondence

To

The Editor,
"The Indian Veterinary Journal."

Sir,

Lately while going through the pages of May 1944 issue of your esteemed *Journal*, I came across two clinical articles—one "Double Spleen in a Goat" by Mr. Nazir Sadiq and another "Echinococcus Cyst in the Kidney of a Cow" by Mr. M. Maqsood, of the Punjab Veterinary College, Lahore.

The writer of the "Spleen-case" has cited many references of such abnormalities being encountered at times of different organs in various species of animals; but his case under report was that of a Goat in which

double spleen was discovered. Might I state for Mr. Sadiq's information that presence of Supernumerary Spleen in Dog as well as in Cat has been noticed in the Bengal Veterinary College Hospital also and was reported by Mr. H. C. Gangulee of the College in the London Veterinary Journal of February 1923 and by late Mr. S. N. Mitter in the same Journal in May 1912. Splenectomy operation besides being reported on rats, mice, sheep, pig, cattle and horses by different writers has been successfully performed also on Dog in the Bengal Veterinary College Hospital by Mr. S. C. Mukerjee, and it was reported in *The Indian Veterinary Journal*, Vol. II, No. 2, in 1925.

Regarding "Echinococcus Cyst in Kidney", I would like to draw attention of Mr. Maqsood to a note "Echinococcosis of the Heart in a Bullock" by Mr. H. C. Gangulee in the Veterinary Record, London, of 25th November 1922.

May I request you, Sir, to kindly find a small space for this note in the next issue of your *Journal*. I would be obliged.

Calcutta }
21-5-1944 }

Yours faithfully,
P. C. GANGULEE,
Special Post Graduate Student,
School of Tropical Medicine.

To
The Editor,
The Indian Veterinary Journal.

Sir,

REF: Your *Journal I. V. J.*, Vol. XX No. 6 for May 1944, page 245-247. Mr. N. Mahadevan's paper entitled "The House Dog: Its Education and Training."

Please bring my paper entitled "Pariah Dogs" published in the *Veterinary Journal*, London, Vol. 82, No. 7 for July 1926—page 378 to 380, to the notice of Mr. N. Mahadevan and oblige.

Thanking in anticipation,

Rawalpindi }
24-5-1944 }

Your sincerely,
A. C. AGGARWALA,
Captain, A.I.R.O. (Vety.)
Assistant Veterinary Research Officer.

Impressions of the Conference

To
The Editor,
"The Indian Veterinary Journal."

Sir,
Please be good enough to publish my impressions of the Conference of the All-India Veterinary Association, Madras Branch, held in April 1944.

After a lapse of nearly a decade—a period of extraordinary activity in all other Departments—the members of the All-India Veterinary Association, Madras Branch, met in Conference at the Veterinary College. The Conference started under very good auspices, ran through a crowded programme and ended successfully after a two day session. There was a record gathering of Veterinarians from all parts of the Presidency and one most pleasing sight was the presence of the old and trusted friends of the service who, unlike the spent rockets to which they are often likened, were quite alive and helpful.

The Delegates to the Conference had a royal welcome at the hands of Mr. K. S. Nair, Chairman of the Reception Committee. His welcome bore the impress of his big heart. A man of few words, his brief address showed his old world courtesy and his extreme devotion to duty.

Mr. S. V. Ramamurti, Adviser to H. E. the Governor, opened the Conference. Having been responsible for the present high status and efficiency of the Agricultural Department he is exerting himself to bring this sister Department to the level of the latter and as an initial measure of his goodwill and help consented to open this Conference and give his advice for the development and expansion of this useful Department. His address to the Conference was practical and inspiring and to follow his advice is to see the Department well on her way to the efficiency and improvement envisaged in his address, before the Conference next assembles—not a decade later—but next Easter if not earlier.

The Conference was unique in that it was presided over by the head of the Department. From the date of its inception the Association was not taken to kindly by the authorities of the Department and the bold departure initiated now by Mr. T. J. Hurley to preside over the deliberations augurs well for the future.

It was unique from another point of view also. It brought us into closer and more intimate contact with him. We have known Mr. Hurley the boss but many do not know Mr. Hurley the man. I am sure it would have been a revelation to many who has seen him in the role of the latter. Every word he uttered during the brief session bore ample evidence of sympathy with his subordinates, his patience and his insight into human nature. In his Presidential Chair he looked as though he was in his element. I or rather we saw him laugh and laugh heartily for the first time.

The morning session came to a close with a vote of thanks proposed by Rao Sahib Mr. Kailasamier. One cannot think of the Veterinary Department without Mr. Kailasamier. The controversial affairs which came before the Conference, the resolution for the redress of the many grievances of men in service, the anomalies created by the recent generous increase in the scale of pay becoming subject to 22 rule (a) of the Fundamental Rules and many others, would not have come out successfully but for his able exposition of the state of affairs and eloquent pleading in the cause of the sufferers. We cannot think of any improvement in the Department, any good that has been done to the hard working subordinate in which Mr. Kailasamier's generous fingers have had not a touch. In functions like these there is no occasion to thank the proposer of the vote of thanks; so we shall pray for his long life and continued service to the Department and his country.

The afternoon proceedings of the first day started with subjects Committee meeting. After the election of office-bearers for the ensuing year, the Subjects Committee went to the question of disaffiliating the Provincial Branch from the All-India Veterinary Association. The discussion was lively, feelings ran high and much steam was let off on both sides—for and against Mr. M. S. Sastry, the heart of the Association who has faced many a storm before, in a touching appeal convinced the audience of the harm and unwholesome effect of such a resolution and it was finally dropped. The afternoon session ended with the reading of some professional papers and cinema shows, both of which were interesting and instructive.

The Second Day's proceedings of the Conference dealt with subjects of Professional, Provincial and Service importance. The increase of pay of the men in service, recently sanctioned, came in for a good deal of talk. What apparently looks like a generous scale has lost much of its attractiveness due to the fixation of the salary from 1-4-44—the date from which the G.O. sanctioning the revise comes into force. The increase in the scale of pay is, of course, sanctioned with a view to attract young men to take up the Veterinary course, but that should not let down men in service who have given their all to make the Department what it is to-day. The various anomalies of the operations of the G.O., the heart burn and discontent caused by it to many were discussed threadbare. The President who was in no small measure responsible for this increase, appeared to have been convinced of the reasonableness and justness of our demand and we fervently hope that his recommendation to fix the salary taking the service into consideration—as was done before—will be viewed justly and sympathetically by the Government.

A few more resolutions of a non-controversial nature were passed. A special significance attaches to this conference. This is the first of its kind when the Director of Veterinary Services consented to preside over its deliberations. The head of a Department presiding over a conference of

subordinates of the Department has a peculiar importance of its own. It brings into light the qualities of the head of service. It is my view with which most of my colleagues will agree that in spite of his hard and rough (seemingly) exterior unconventional too, it may sometimes appear, that the President carries a big head and a big heart. Those in the Conference would have seen and felt it in the very commendable way he conducted the proceedings, the very practical and highly commonsense viewpoints he brought to bear on the subjects under discussion. Whether an All-India Association or Departmental Association, its meetings and deliberations, its Conferences and confabulations must have the head of service to guide them. Then only we can hope to achieve at least a little of what we aspire for. This Conference has proved this beyond question and I believe my colleagues will agree with me.

These two days I had been observing an unostentatious, simple and silent turbaned officer extremely busy yet appearing to have nothing to do with what was taking place around him. It was the capable and efficient organiser of this Conference, the author of many of the resolutions, the caterer who looked to the creature comforts of the Delegates, the right hand of the President, carrying a big file of papers under his arm, often seen to be providing the President with facts and figures. He was the Secretary of the Conference Mr. R. Swaminathan, who with his cheelas, a band of young men, contributed in no small measure to the success of the Conference.

Having pointed the bright side of the show, I feel I should mark some of the dark spots also. The subjects read in the Conference were all important but if they had not evoked an intelligent and experienced discussion which they deserved, it is not the fault of the Delegates. Even a few days' prior notice of the subjects to the Delegates would have helped them in equipping themselves with the matter for a helpful and interesting debate. In the discussion that ensued this lack of equipment was evident but the President's ripe experience, practical knowledge, his masterly analysis of some of the subjects were very helpful in rounding off the discussion.

Another point which deserves consideration at the hands of the authorities of the Conference is the two days session. In view of the importance of the subjects that come before the Conference, the bearing of the resolutions on the improvement of the profession and its status, one would think justifiably that the days allotted for the conduct of the proceedings were much too short. What with the unconscionable extension of the schedule time of every item of programme, the interference with the leisurely lunch and tea, the winding up of the proceedings of the Service Association in the middle of an important resolution, the delegates should have felt cramped for time. At least a four day session would meet the requirements of a Provincial Conference.

Provision should also be made for more practical demonstrations, visits, to places of interest as Poultry Farm, Research Institutes doing work on allied subjects, Model Dairy Farms, etc. Considering the immense usefulness and manifold advantages to the Department in her members attending such instructive and important Conferences, will it be asking too much of the powers-that-be, to grant at least the actual travelling expenses to those attending them? Will it be asking us too much of the members of the service to contribute liberally in money and papers and gather in larger numbers in such conferences to make them a greater success? I hope not.

The Conference was a success with a big S. Between now and the next session we have to put into action the many pious and hopeful resolutions we have passed. May god help us to that end.

“A DELEGATE.”

Extracts

DEVELOPMENT OF AGRICULTURE

1,000-Crore Scheme

New Delhi, June. 20, 1944.

A plan for the development of agriculture and animal husbandry in India, involving a capital outlay of Rs. 1,000 crores is suggested in a memorandum prepared for the consideration of the Advisory Board of the Imperial Council of Agricultural Research. The plan has been prepared by a Special Committee and has the immediate object of increasing production by 50 per cent in the next ten years and by 100 per cent in the next 15 years.

Besides capital expenditure, the plan provides for a recurring annual expenditure of Rs. 20 crores, an average total expenditure of nine annas per acre yearly, when all the cultivable areas have been brought under cultivation. The plan aims at securing an output of the right kind for every individual and improving his standard of living.

The memorandum suggests that production of cereals should be increased by 10 per cent, pulses by 20 per cent, fats and oils by 250 per cent, foods by 50 per cent, vegetables by 100 per cent and milk by 300 per cent. Higher production of cash crops and better quality and proper balance between food and cash crops is indicated. The memorandum points out that out of 614 million acres of cultivable land, about 250 million acres are at present uncultivated or fallow. It suggests that steps should be taken to find out what exactly prevents large blocks of land being brought under cultivation and the preparation of reclamation and utilisation schemes.

Bigger and better crops, the memorandum goes on, will need water in the right quantity and at the right time. Besides canal irrigation, water may have to be lifted by mechanical means. Where there is no free flow, tube wells and tanks may have to be sunk. Reservoirs will have to be

built to conserve rain water and bunds constructed where necessary. The memorandum emphasises the need for plentiful supply of manure, including chemical manure. By use of manures and fertilisers, production could be increased by 10 to 15 per cent. A seed farm should be set up in every district and arrangements made for multiplying facilities for storage and distribution of seeds. Efforts should be made towards consolidation of holdings and co-operative, farming.

Referring to methods for improving marketing, the memorandum suggests that villages should be organised to sell co-operatively and sell surpluses jointly. Government should guarantee an assured market at reasonable prices. The setting up of a Food Technological Institute along with Regional Stations should be arranged.

FEDERAL DEPARTMENT OF AGRICULTURE

In regard to animal husbandry, the memorandum suggests methods of cattle improvement under the headings, Feeding, Breeding and Management of Disease Control. The memorandum recommends that the Imperial Agricultural Research Institute and Imperial Veterinary Research Institute should specialise in researches of a fundamental nature. Their programme should be co-ordinated with those of provincial departmental research institutes and universities. The memorandum says that the Centre must take the lead in many matters if progress is to be rapid. To this end, it is considered necessary that the time is now ripe for the creation of a Federal Department of Agriculture. Such a department would be charged with the duty of fostering agriculture and animal husbandry in their broader sense and in all their phases.

The scheme was explained to pressmen in New Delhi this morning by Sri P. Kharegat, Additional Secretary in the Department of Health, Lands and Education. He emphasised that the estimate of costs given in the plan referred to British India only, but the general lines of development indicated applied to India as a whole, including Indian States. Improvement on the scale contemplated in the plan could not be brought about unless the necessary staff existed. The first priority of action should be given to training of staff in all grades and in the necessary numbers. Simultaneously, the surveys, which are necessary before reclamation and utilisation schemes could be drawn up, should be taken on hand. In every district, an agricultural association should be set up. For every village, there should be a village guide who will act as a link between the Technical Expert and the cultivators.

Madras Government's Attitude

Madras, June 21

The formulation of general policy towards post-war agricultural development by the Government of India in the light of various schemes published including the Bombay Plan, is expected to be one of the principal tasks of the forthcoming meetings of the Post-war Agricultural Reconstruction Committee on 24th June at Simla and the Imperial Council of Agricultural Research on 7th July at Delhi, it is learnt here.

The general attitude of the Madras Government towards any scheme, it is understood, will be governed by the broad principle of attaining

self-sufficiency in the matter of food production in the province and seeing that the cultivator gets as much as possible for his output. The war, it is pointed out, has revealed deficit in almost all the varieties of foodgrains, the pulses alone providing a deficit of 150,000 tons. Dr. B. Viswanath, Director of Agriculture is to represent the Government of Madras at both the meetings and is leaving for Simla to-morrow. He said that the whole idea of post-war plan was to produce more and attain regional self-sufficiency.

This could be achieved among other things by the extension of cultivated areas, the intensification of yield by the aid of chemical fertilisers, the distribution of improved variety of seeds, and the provision of technical aid by trained men. The strength of the Agricultural College at Coimbatore had been doubled. The training would take three years to be completed and these students would have to play their due part in the post-war agricultural development. A.P.I.

— "Hindu" 22-6-44

ENOUGH FOOD FOR ALL

Sir Pheroze Kharegat on Government Scheme

NEW DELHI, June 21

Explaining the 1,000-crore scheme for the development of agricultural and animal husbandry (details of which have already appeared in THE HINDU). Sir Pheroze Kharegat, Additional Secretary, Education, Health and Lands, explained that it was not a post-war plan, but one which had been taken in hand in connection with the 'grow more food' campaign. It will merge in course of time with the post-war plans for general betterment.

A capital expenditure of Rs. 1,000 crores and a recurring annual expenditure of Rs. 20 crores are provided. These figures compare with those of the Bombay Plan, which provided for an expenditure of Rs. 1,245 crores to achieve an increase of 130 per cent in agricultural production in 15 years.

The cost of the Government of India plan has been worked out in terms of pre-war values. On the basis of present cost, it is likely to increase to about Rs. 2,000, crores.

Enough food of the right kind for every individual and a higher standard of living for all are the aims of the plan. But it was not possible to frame a plan for the whole of India, sitting in an air-conditioned room in Delhi, Sir Pheroze remarked, in emphasising that the attempt made in the Special Committee's memorandum not to put forward a complete scheme, but only to make suggestions as to the lines along which work should be undertaken, mainly by the provinces.

The Government of India had agreed to give financial assistance to the Provinces in carrying out the scheme. For instance, of the recurring expenditure of Rs. 20 crores, the Centre would bear about Rs. 2½ crores. In the new grants given under the grow more food campaign, Sir Pheroze indicated, an attempt would be made to correlate increased production with the grant of financial assistance and to secure that the increased production would be available for distribution to deficit areas.

Sir Pheroze stressed a number of points of the plan. The most important, requirement from the point of view of the Agricultural Department was trained staff. A scheme of intensive short-term training of agricultural

staff, he said, had been suggested to Provincial Governments. The needs of the provinces were being ascertained and arrangements were in hand for starting training courses at the various Agricultural Colleges.

Under manure, the plan estimates that 2½ million tons of nitrogen are required annually. Production can be increased by about 10 or 15 per cent by the use of better seed, says the memorandum. A seed farm should be set up in every district to produce pedigree seed and to arrange for their multiplication, storage and distribution. This should be combined with sound cultural practices, including the best rotation of crops.—A.P.I.

— "Hindu" 23-6-44

DEVELOPMENT OF AGRICULTURE

Policy Committee's Suggestions

FEDERAL COUNCIL OF AGRICOLOGY PROPOSED

SIMLA, June 29.

The four-day session of the Policy Committee on Agriculture, Forestry and Fisheries concluded in Simla to-day. The Committee has recommended a comprehensive plan for more efficient means of production and the organisation required for research and development.

The Committee has laid down that those items of work should be taken up first which are likely to give the maximum amount of food in the minimum possible time. It has also proposed that the main functions of the Centre should be to help, guide and advise provinces so as to secure co-ordinated development and production.

The Committee decided to request Provincial Governments to help the Committee by communicating to it their views, criticisms and concrete suggestions in respect of the various recommendations of the Committee within three months.

In his closing remarks, the Hon. Sir Jogendra Singh, who presided, said that they would meet again in October to carry on the work they had started.

Sir Chunilal Mehta's resolution placing on record the Committee's appreciation of the useful and important memoranda on agricultural development in India prepared for the Advisory Board of the Imperial Council of Agricultural Research, on Forests by Sir Herbert Howard and on Fisheries by Dr. Baini Prasad and approving in general the recommendations made in the memoranda was passed.

Committee's Plan

It was proposed that a Central Land Utilisation Board should be set up to plan and co-ordinate work in respect of soil erosion, forestry, land reclamation, irrigation works and other forms of land improvement with necessary finance and staff. The extent of culturable waste and the causes which prevent it from being cultivated should be ascertained and the requisite facilities provided for utilising such land to the best advantage. A sub-committee should be appointed to suggest how the production of milk and fish may be increased.

On the research side it was recommended that a Central Department of AgricoLOGY should be established, the Imperial Council of Agricultural Research should become a Federal Council of AgricoLOGY dealing with both research and development. Agricultural and animal husbandry research

institutes should be strengthened and central commodity research stations should be established for the more important commodities. Staff should be appointed at the Centre to help and advise provinces on agriculture and the staff maintained by provinces should be strengthened.

The Committee further recommended that the Central Government should provide an assured and steady source of income for the various Central organisations and activities proposed for agricultural development such as might be secured by the proposal to reserve for the purpose one half of the profits of the Reserve Bank accruing to the Government of India.

The items of work which the Committee recommended should be taken up first include training of staff, essential surveys, manufacture or import of machinery for cultivation, irrigation, hydro-electric power and fertilizers. Other items of improvement which provinces may take up include irrigation, manure, land improvement, seed, cultural practices, grading cattle for milk and draught and the provisions of better marketing facilities.

Forest Rehabilitation

Earlier, the Committee considered the rehabilitation of existing forests, the establishment of new forests and the development of village plantations. It was proposed that each Province and State should aim at having not less than 20 per cent and if possible 25 per cent of its total area under forest and so distributed that the villager may be enabled to satisfy his requirements of agricultural timber and fuel within a reasonable distance of his home. A classification should be undertaken forthwith of uncultivated land to determine the areas in which timber can be grown or forest management should be introduced. Soil conservation circles should be formed in each Province and State to deal with land management, the regulation of grains with due regard to the needs of the cattle population and growing of trees whether as a protection against floods or erosion, or to supply the needs of the rural population.

The Committee further recommended that steps should be taken for the development of industries for the utilisation of minor forest produce which will provide avenues of employment for the growing population in forest tracts—A. P. I.

"Hindu" 1-7-44

Errata

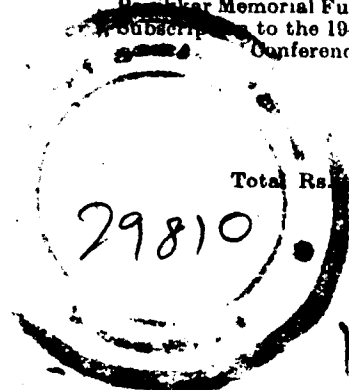
In Vol. XX, No. 6, on page 289, for the statement of Receipts and Charges of the Treasurer, please read the following:

The statement of Receipts and Charges of the Treasurer is appended below.

Receipts		Charges	
By Opening Balance	Rs. 317 8 4	To Postage	Ra. 17 3 6
.. Interest	13 4 8	.. Entertainment charges	121 2 3
.. Subscriptions	155 0 0	.. Expenses in connection	
.. Panikkar Memorial Fund	925 2 0	.. with Panikkar Memorial	
.. Subscriptions to the 1944		.. Fund	61 13 0
.. Conference	400 0 0	.. Panikkar's Portrait	44 8 0
		.. Printing	3 12 0
		.. Miscellaneous expenses	6 7 0
		.. Balance on hand and	
		.. in the Savings Bank	1556 1 3
Total Rs.	1810 15 0	Total Ra.	1810 15 0

R. SWAMINATHAN

Lecturer, Madras Veterinary College.



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