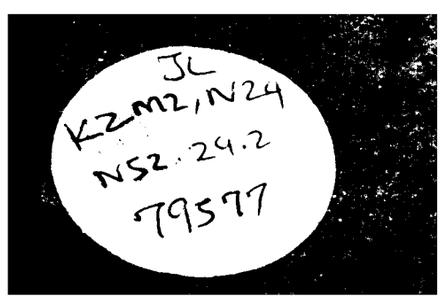
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THE INDIAN VETERINARY JOURNAL

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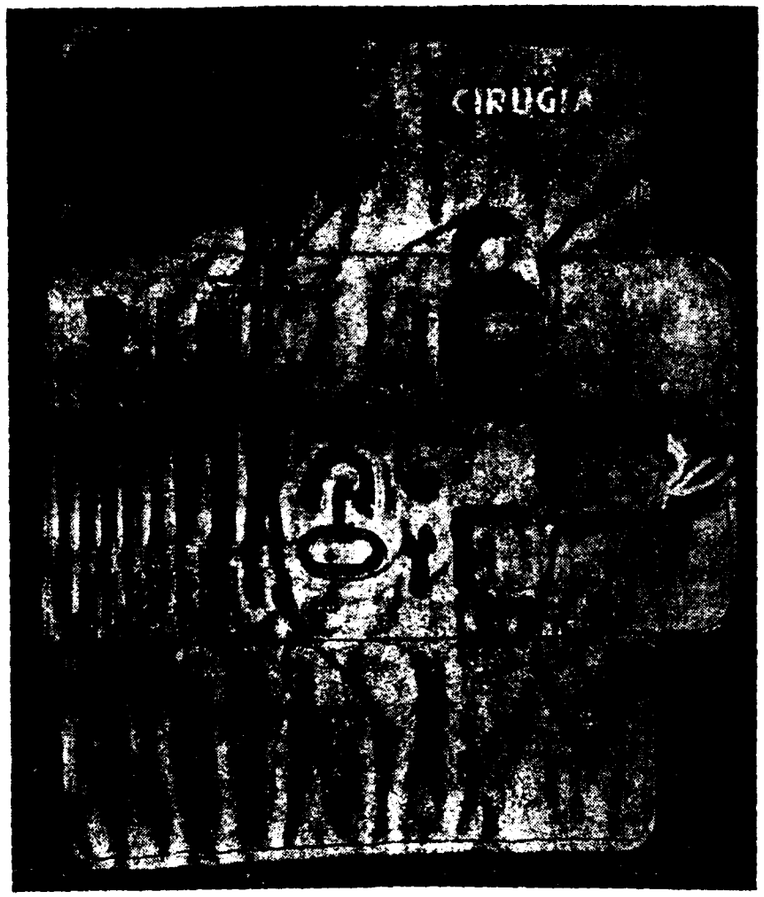

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The Indian Veterinary Journal

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

Vol. XXIX **SEPTEMBER 1952** **No. 2**

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Vol. XXIX SEPTEMBER, 1952 No. 2

Special Article

CEREBRO-SPINAL NEMATODIASIS: A NERVOUS DISEASE OF ANIMALS CAUSED BY IMMATURE NEMATODES (*Setaria Digitata*) AND ITS RELATIONSHIP TO KUMRI OF HORSES IN INDIA

By

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[Received for publication on 12—7—52]

This article has been written at the special request of the Editor of the *Indian Veterinary Journal,* in order to bring to the notice of Indian veterinarians of the work which has been done on the disease, now called by us, cerebro-spinal nematodiasis. For full accounts the reader can refer to a number of papers which have been published elsewhere by Innes, Shoho and Pillai (1952), in which all possible repercussions are considered. Although only this single reference is given here it should be emphatically stressed that the original work on etiology was in fact made by Japanese workers, the papers of which have been obscured because of the war, and of the Japanese language. The paper by Innes, Shoho and Pillai pay full tribute to these and give all important Japanese references, and deals with various events which gradually led to a solution of the nature and cause of this strange paralytic disorder.

This epizootic neuroparalysis of domesticated animals (goats, sheep and horses) in Japan, and (goats) in Ceylon has occurred for many years, possibly over fifty, and perhaps even longer than that. It may be understandable from a consideration of the described facts why it has taken so long for a better understanding of the natural history of this paralysis to be obtained. The same can then apply to the problem of kumri (lumbar paralysis) of horses, which has occurred in India, possibly since 1800, for we think kumri is indeed the same nervous disease caused by nematodes.

In Japan, Korea and Ceylon the disease was known years ago to be a seasonal one, occuring regularly each year in the summer and autumn, and to affect large numbers of animals in some years in certain localities. The disease thus was not a rare sporadic one, although from all accounts, on occasion only a single animal might be affected here and there in some areas. Clinically, some animals suffer from an acute, or subacute paralysis of all four limbs, or only the hind limbs. In other animals the signs may be only those of incoordination of movement, and muscular weakness, so that the animal may sway about when turning. Some die quickly, others linger a few weeks, and some recover with some residual neurological defects, such as impairment of gait. In view of what is known about the pathology, all these clinical variations can be explained, for the clinical picture would depend on the location of the lesion (s), and the severity of the process, in the nervous system. The clinical picture in its entirety is thus exactly analagous to that which has been so often described for kumri, one of the best accounts of which is that by Macalister (1917). It is indubitable that in many countries, however, this clinical syndrome could be easily confused with other nervous diseases, particularly some of the virus encephalitides, *if* too much reliance was placed on clinical findings, and if pathological examination of the nervous system was not carried out in the most meticulous way.

The essential pathological process is that of a focal encephalomyelomalacia, which simply means softening of nervous tissue, and this may proceed to liquefaction and even cavitation in a few days. The lesion may be single, or there may be a few foci, but rarely are there disseminated changes. The process may attack any part of the nervous system, although it has been noted that the spinal cord, the thalamus or the cerebellum might be more commonly involved than other regions. Haemorrhage is not always present, for this would depend on the migrating worm striking main vessels, hence *naked eye examination alone* of the brain and spinal cord might not be sufficient to detect any pathological process. Therein lies perhaps the reason why the true nature of the disease has remained such a puzzle for so many years. In several goats from Ceylon, the whole nervous system was embedded in paraffin for section cutting, whole coronal slabs of the brain being cut, and transverse cuts with longitudinal ones being made of the entire spinal cord. This indicates the arduous nature of the pathological examination which might be required in some cases. There is no record of this type of examination ever having been made in cases of kumri, and therein lies perhaps the solution to the whole problem of the paralytic disease known to occur in India (perhaps also Burma and Assam) in horses (and goats). Further, in pathological examinations, if by chance a random selection of tissue slices were made, then it is possible for the observer, not fully acquainted with the whole pathology

of nematodiasis, to be entirely misled. For example, inflammatory infiltrations containing many eosinophils may be found in a patchy manner involving the meninges and nerve roots, and this may not be associated with a focus in adjacent nervous tissue. This feature might therefore foster the idea that only a meningitis was present. The total process is quite diagnostic, and unlike the pathology of any viral, bacterial, protozoal, mycotic or toxic or deficiency nervous disease. The process in acute cases is a true malacia, but occurring in a restricted area, in cord or brain, as the case may be, and if serial sections are examined, a tracking from *pia* in, and out, of nervous substance may be determined. In very mild cases, which showed only slight clinical motor inco-ordination, perhaps only a patchy eosinophilic meningitis, or inflammation of nerve roots might be found. These findings are consistent with our concept that the process is simply due to a mechanical traumatic effect due to the wandering of the worm in and out of nervous tissue. This was borne out by observations on the effect of a simple experimental stab wound made by a needle in the spinal cord of sheep. Almost a replica of the acute lesion of nematodiasis was produced in one sheep, which was allowed to live, but paralysed in its hind limbs, for five days after the needle wound. The only feature missing was, in fact, the eosinophilic infiltrations.

Japanese workers first showed that the disease in Korea and Japan was caused by young worms—*Setaria digitata*. This was based on the association of worms with lesions, and then later by reproduction of the disease experimentally in sheep, goats and horses. The etiological concept was first suggested by Fujita and later proved experimentally by Niimi, Kimura, and a total of 28 other Japanese workers. Subsequently to a study of the pathology of the goat paralysis in Ceylon, from a comparison of the descriptions and illustrations of the Japanese disease, Innes (1951) concluded that in fact this same process was involved in the goats in Ceylon. At the instigation of Innes and Shoho, McGaughey (1952) has now found the causal nematodes, in a number of paralysed goats in Ceylon, so that no doubt remains we are dealing with an identical disorder. The name now given to the disease (by Innes and Shoho), cerebro-spinal nematodiasis, is appropriate, for they consider that the same paralytic disease, and the same pathological process, might possibly be produced by other species of nematodes under certain circumstances.

The natural host of the *Setaria digitata* is cattle, in which the filaria reside in peritoneum and mesentery without producing any visible pathological effect, and in which species microfilaria finally enter the blood. This same species of filaria is also said to affect other bovidae in India. In the Orient, the insect vectors (intermediate hosts) are mosquitoes, and which in the normal course of events transmit the microfilaria to fresh cattle hosts. The microfilariae, on being taken up by the insects, mature

as infective larvae in about 14 days. When these are transmitted, however, to *unnatural hosts*—namely sheep, goats and horses, they wander through the body and may finally migrate to the nervous system, and produce therein the damage described. We do not believe this process is simply one of chance, but that in *abnormal hosts* under certain conditions worms may be strangely attracted to invade the central nervous system, and Innes, Shoho and Pillai give various observations to support this theme.

The difficulties related to determining the helminthic cause are highly significant, and require comment. If these are borne in mind then it becomes evident how the solution to kumri has baffled previous investigators. *Setaria*, like all filaria, are notorious wanderers; in affected animals, having produced a lesion for example in the spinal cord (and the meningitis), the immature worm may straggle away and be found in the cerebro-spinal fluid, or it may leave the nervous system after the latter is placed in the formalin solution and be found in the latter. Further, it may be imposssble to find worms at all in the nervous system or the CSF of animals which have had a history of chronic paralysis. In the latter, they may wander away, die and become calcified, or only remnants of a hyaline capsule might be found. Unless many sections of a particular area of softening were examined, it might largely be a matter of luck in finding a small worm in an actual lesion. If a lesion was not detected macroscopically, it might be like looking for the proverbial needle in the haystack to find a worm in the brain and cord of a sheep, but more so in the voluminous nervous system of the horse. With all these facts in mind, it is not difficult to be wise in retrospect, and understand why the disease has remained such an enigma for so very many years, or why the disease occurs in many parts of the world, remote from the Orient, and still evade recognition. In veterinary research much of this might be blamed on the general neglect of good study of the nervous system by veterinary pathologists. Absence of such studies would indeed leave an investigator in a maze, seeking to understand why affected animals have varied forms of inco-ordination, or true paralysis. Innes, Shoho and Pillai deal with this in detail, and point out there is inferential evidence indicating that indeed the disease might have occurred, for example, in deer in Germany and Texas, in goats in India and Persia. They suggest that the so-called wobblers of thoroughbred foals in the U.S.A. might be cerebro-spinal nematodiasis, and that this disease is analagous to kumri in India. There are thus excellent leads for fruitful investigations by veterinarians in India, by which the problem of kumri can be tackled, and a solution obtained to a disease which has been a puzzle for well over 100 years.

It might be helpful and of great interest if a few further comments were made on the history of kumri. There would appear to be little doubt that this disease has been known in the East at least since 1800, as will be

apparent if the various ancient references by Macallister are carefully read. In many old papers there is a curious reference to the disease being frequently seen in Australian horses imported into India. This is like some of the history of cerebro-spinal nematodiasis, for the first record of the disease in Japan by Emoto (1927) concerned goats imported from Switzerland, and Crawford drew attention to the fact that the affected goats in Ceylon had often been imported. More important still it is evident from Macallister (1917) that there were clear leads to the establishment of the pathology by some earlier studies. Place (and later Saunders) in India, both noted naked eye areas of softening in the spinal cord in cases of kumri. Unfortunately, this was not followed up by a careful enough histological study. Even the causal association of *Setaria* with kumri has been raised repeatedly, but the problem somehow got confused with that of general visceral worm infestations. Various observers could not understand why the nervous disease might be caused by a single or a few worms of one species, and be unassociated with nematodal invasions of other tissues in the same host. Some workers indeed found worms in the spinal canal of cases of kumri, but apparently could not be convinced that these were the cause of the paralysis. Others did believe in a filarial cause, but did not carry the investigation to its logical conclusion and correlate the worm with its pathology. There were also shrewd observations regarding successful treatment of kumri with arsenical and antimonial compounds, which might have been a clue to a possible helminthic cause, but this escaped further follow-up. Many of the early investigators were also dealing with chronic cases of kumri, horses which had shown inco-ordination and ataxia for weeks and we know, from our work on nematodiasis, that these would not be the most fruitful source of material for study. It would be essential for acute cases of a few days' duration to be thoroughly examined at autopsy, paying strict attention to the possible pitfalls which have been outlined above. Finally, an even more bizarre fact of history can be mentioned, for it may exemplify the statement there is nothing new under the sun, indeed, as the author has frequently emphasised, there is a constant succession of articles in our journals which deal with a so-called "new disease" of animals. But perhaps there are no new diseases, for no disease is *recognised* until it is *found* in the first place, and that only materialises when pathologists look with great care. There are many animal diseases which are well recognised to-day, but which have only been sufficiently studied within this past 20 years; it is as clear as daylight that, if sufficient attention had been paid to pathology before, elucidation of the problem would have come much earlier.

It is strange to find that observations do exist in the literature of a by-gone age, which might have been of help, but which became part of the limbo of forgotten things. For example in Raillet (1895), it is apparent

a similar paralytic condition in horses to kumri was known in Europe before then; the causal worm was called ***Filaria haemorrhagique***, and Raillet even gives crude drawings to represent focal lesions in the spinal cord. It is also peculiar to find that the word kumree (kumri) was used by veterinarians to describe a paralysis of horses in England, and in the early part of the 19th century. Hence it might be questioned whether perhaps a similar disease did actually exist in horses in England at that time, but disappeared just like malaria did in human beings. Clinical descriptions of that era, we know, are inadequate on which to base much belief in this direction, and at that period pathology, as we know it now, was practically non-existent in veterinary work.

Finally it is important to bring into line with the paraplegia caused by worms, the problem of "worm-in-the.eye" of horses in India—known for years to be associated with the presence of *Setaria*. There has been much confusion regarding the actual species, for some workers refer to the worm as *Setaria equina*, others *S. cervi* and others *S. digitata* (syn. *S. cervi*). Many veterinarians in India, years ago, believed there was some association with kumri, for some animals might be affected with one following the other or with both. We consider that ocular filariasis may be no more than an extension of the cerebro-spinal nematodiasis complex into another location (the eye), and that the worms might indeed travel into the eye from the nervous system *via* the optic foramen.

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General Articles

STUDIES ON THE EFFECT OF STILBESTROL ON THE STIMULATION OF LACTATION IN VIRGIN AND IN DRY NATIVE GOATS

By

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(Received for publication on 16—6—52.)

The influence of the sex hormones on reproduction and associated phenomena has long been known, but the high cost of the natural estrogens prevented their use in extensive experimentation and practical application. This obstacle has been largely removed by the introduction of the relatively simple and cheap synthetic compound diethylstilbestrol (stilbestrol).

Since the discovery of this new synthetic estrogen, initial tests have been made with promising results. In the field of therapeutics, stilbestrol has proven remarkably effective in the treatment of pyometritis, retained placenta and anestrus in different animals. For the animal husbandman, the synthesis of this estrogen has brought his share of the blessing.

Dodds *et al.* in 1938, as cited in the report of Harris and Thimann (6), recognized the estrogenic activity of the stilbene compounds. One of the compounds they synthesized is known chemically as diethylstilbestrol (4 ,4', dihydroxy-a-b-diethylstilbene). This new drug is not only apparently capable of producing all the physiological effects of the natural estrogens, but, per unit of weight, is several times as effective as any of them when administered orally. Davison (4), however, noted certain pharmacological differences between stilbestrol and the natural estrogens. The latter cause an increase in the acetylcholine content of the uterus, and are largely destroyed by the liver. Stilbestrol does not increase the acetycholine content of the uterus, is less apparently affected by the liver and eliminated to a much greater degree in the excreta, particularly in the urine.

The cheapness and availability of this new, powerful synthetic drug have stimulated researchers to find new uses for it.

Conn (3) reported that most of his cases with retained placenta responded to diethylstilbestrol treatment within thirty-six hours after injection. This relief was followed by heat after another thirty-six hours in almost all the animals treated.

Gleeney (5) found the use of stilbestrol a valuable supportive therapy in pyometra as well as in inducing estrus in cows.

According to Lewis and Turner (7), Folley and his co-workers claimed to have successfully induced lactation in three virgin female goats and a virgin heifer with the use of stilbestrol dipropionate in oil applied to the udders of these animals.

Using stilbestrol in virgin goats, Lewis and Turner (8) caused abundant and prolonged lactation from lobule-alveolar glands. These investigators found no appreciable increase in the extent of the mammary glands. They claimed, however, that the drug, whether given orally, subcutaneously or by inunction, will result in the secretion of milk in virgin as well as in dry mature goats.

Cockburn (2) demonstrated the stimulation of lactation in a three-year old barren goat with the use of stilbestrol. He observed the same reaction in barren heifers given the same drug by injection.

Peeters *et al.* (13) obtained good results with the use of stilbene in the treatment of agalactia in the mare. A ten-milligram stilbene ointment in one per cent concentration smeared daily during a fortnight before the probable date of parturition was found sufficient to cause growth and development of the milk gland.

Branker (1) claimed that dry cows can be brought to milk by implanting a 1-gram tablet intramusculary. However, if the implant is made while the animal is in lactation, the tendency is to abolish milk secretion. Davison (4) especially recommended stilbestrol in fairly large doses for the suppression of lactation in women. He suggested five milligrams of stilbestrol orally, one to three times daily for two to four days, or by injection of five milligrams once or twice daily for two to four days. Mixner, Meites and Turner (11), using the same drug, observed that the inhibition of lactation in lactating goats was proportional to the dosage of stilbestrol administered; that is, the smaller the dosage, the less was the suppression of milk flow, while a larger dose would inhibit lactation to a greater degree.

The object of the present study is to determine the effect of diethylstilbestrol on native female goats, virgin and dry mature, particularly on milk production. So far, no work of this kind has ever been done in the Islands, so that the data herein presented may serve as a local contribution to those harvested from experiments conducted abroad.

Materials and Methods

A total of eight apparently healthy native virgin, and four dry mature female goats were used in this study. The former ranged from four and a half to nine months in age, and from twenty-two to thirty-five pounds in weight; the latter ranged from one to about two years in age, and from thirty to forty pounds in weight. Of the latter group, one (Goat No. 11) was offered by Dr. A. Montaire of the SPCA. This goat was found stranded somewhere in Bulacan Province, and was taken to the SPCA compound to give it the best care possible. The rest of the animals were purchased from farmers in Gumaca, Pitogo and Lucena, Quezon. They were taken to Manila in two's or in three's depending on their availability. They were selected particulary from places where there was no buck in the herd, thus making it sure that the virginity of the animals was preserved. In the course of the experiment, the animals were fed zacate, or allowed to graze on good pasture.

Diethylstilbestrol in oil, 2 mg. per mil. prepared by Jensen-Salsbery Laboratories Inc,. Kansas City, Mo., U.S.A., was used in this study. The drug was injected intramuscularly with the use of hypodermic syringe and needle.

The virgin females were divided into two groups. The first group, (Nos. 1, 2 & 3), received a daily intramuscular injection of 2 mg. of stilbestrol for ten days. The other group, (Nos. 5, 6 & 7), received 1 mg. of the drug for the same number of days. Goat No. 4 served as the control for the first group, and Goat No. 8, for the second group of virgin females. All these animals were weighed prior to the administration of the drug, then at regular intervals thereafter.

The dry female goats, (Nos. 9, 10 & 11), received 1 mg. of stilbestrol given intramuscularly daily for ten days. They were weighed before receiving the injection and then every week thereafter. Goat No. 12 was left untreated to serve as control for this group.

Observations of the treated goats were made on the gross appearance of the mammary glands.

The mammary teats of the virgin and dry gorts were stripped twenty-four hours after the first dose of stilbestrol and daily thereafter, to find out if there was any milk secretion. Once the stripping succeeded, each animal was milked regularly on the same hour once daily until hardly any milk could be obtained.

Results and Discussion

The data gathered in this study are given in Table 1. The milk productions are graphically presented in Figures 1 and 2.

It will be seen in Table 1 that both the 2 mg. and the 1 mg. doses of stilbestrol gave varying results in virgin goats. Goat No. 2 came into milk production nine days after the tenth injection of 2 mg. of stilbestrol. On the first day of milking, it yielded 0.5 cc. of milk. The production gradually increased up to the tenth day, when the milk yield was 20 cc. This peak of

TABLE I

Showing the effect of Stilbestrol injection on native virgin and on dry mature goats.

Goat			Age (mths.)	Weight (lbs.)	Daily Dose (mg.)	No. of days after first injection when milk was secreted	Amount of milk yield (ml.)			Duration of lactation (days)
Physiological state		No.					Min.—Max.	Average	Total	
Virgin		1	5½	31.0	2.0	13	1—15	8	262.0	38
		2	7	26.0	2.0	19	.5—20	12.5	144.5	30
		3	4½	22.0	2.0	17	.5—3	1.75	17.5	12
		4†	9	30.0	0	0	0	0	0	0
		5	5	23.0	1.0	18	1—2.5	1.75	19.0	10
		6	6	28.0	1.0	15	.5—16	8.25	178.0	28
		7	4½	24.0	1.0	17	1—7	4.0	44.0	12
		8†	6	24.0	0	0	0	0	0	0
Dry		9	12	30.0	1.0	12	1—55	28.0	1,915.0	68
		10	15	28.5	1.0	9	2—40	21.0	898.0	50
		11	22	39.0	1.0	6	3.5—95.5	49.5	1,474.0	(X)
		12†	16	27.0	0	0	0	0	0	0

Legend : † Controls.
(X) Still milking when manuscript was prepared.

production lasted three to four days, then the milk yield gradually declined until the thirtieth day of lactation, when the production record equalled that on the first day. Slight enlargement of the udder was observed. It can be stated that the appreciable enlargement was proportional to the amount of milk expressed from the mammary gland.

Goat No. 1 received the same doses as the preceding. But she came into milk three days after the last injection. She produced 15 cc. of milk at the height of production which was recorded two weeks from the first day of lactation. The production gradually declined until the thirty-eighth day of lactation when the animal was almost dry.

Goat No. 3, which received a total dose of 20 mg. of stilbestrol, barely responded to the treatment. This animal did not lactate until the seventh day from the last injection of 2 mg. of the drug. In this particular case, the duration of lactation was only twelve days with an average production of 1.2 cc. of milk throughout her lactation period. No appreciable enlargement of the udder was observed as in Goat No. 1, although milk was produced.

As may be seen in Table 1, three non-parous goats received a daily injection of 1 mg. of stilbestrol for ten days. Goat No. 5, which came into milk eight days after receiving the tenth injection of 1 mg. of the drug, produced 1 cc. of milk on the first day. Five days later, the height of production was 2.5 cc. The duration of lactation was short, lasting only ten days.

Goat No. 6 produced a fairly good amount of milk, giving 0·5 cc. on the first day of milking and a peak yield of 16 cc. on the seventh and eighth days after the first day of milking. The lactation lasted for twenty-eight days.

Goat No. 7 came into milk seven days after the last injection. Its highest production of 7 cc. was realized after five days of lactation, after which, the milk secretion dropped gradually until the twelfth day, when only a few drops of milk could be obtained.

In all these cases, the enlargement of the udder was not appreciable except in Goat No. 2 in which the size of the mammary gland may be compared with that of a chico fruit divided into halves.

It must be stated that the first secretions obtained from the udder of the virgin female goats were syrupy in consistency, having a creamy or whitish cream appearance which later became opaque white.

The milk production of the dry goats given a daily injection of 1 mg. of stilbestrol is shown in Table 1 and graphically presented in Figure 2. It will be noted that the milk yield records of this group are very much different from those of treated virgins.

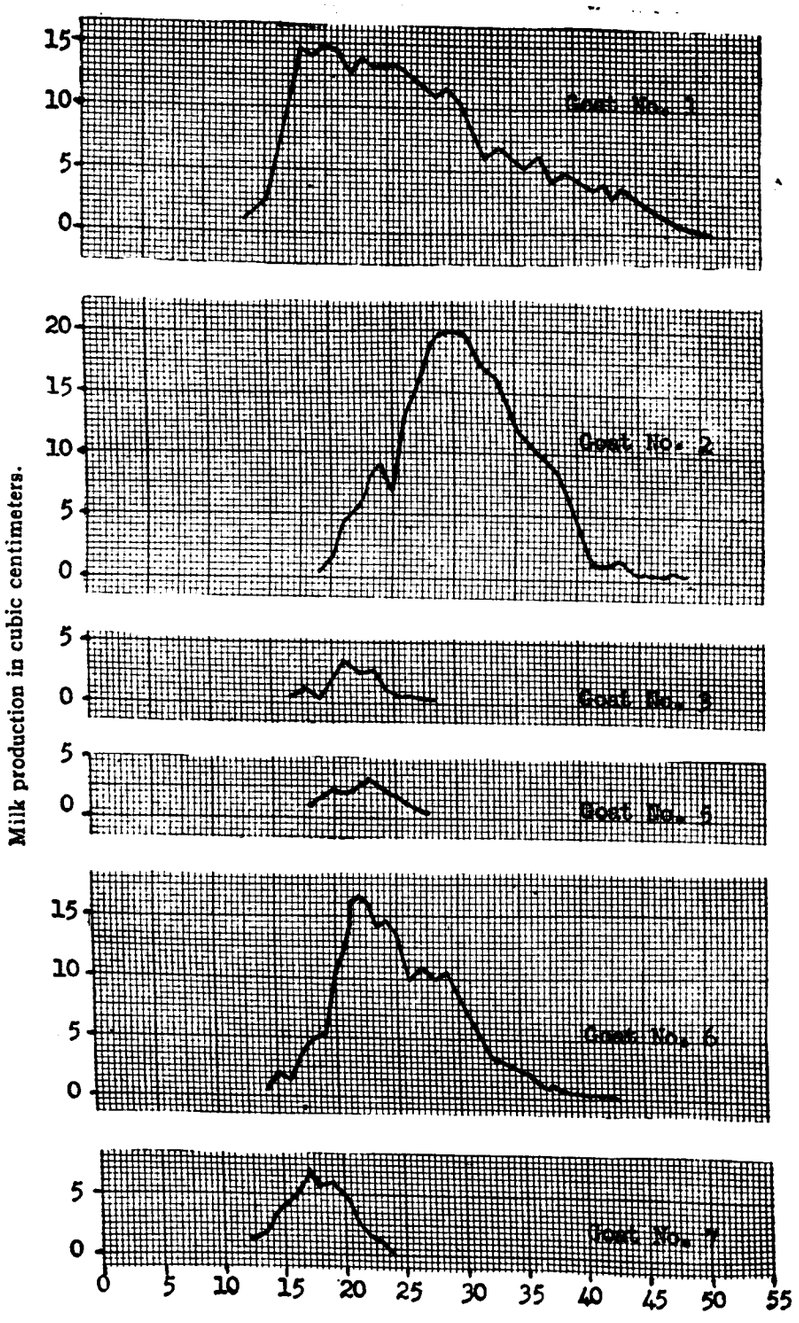

Fig. 1—Graph showing the milk production curves of virgin goats.

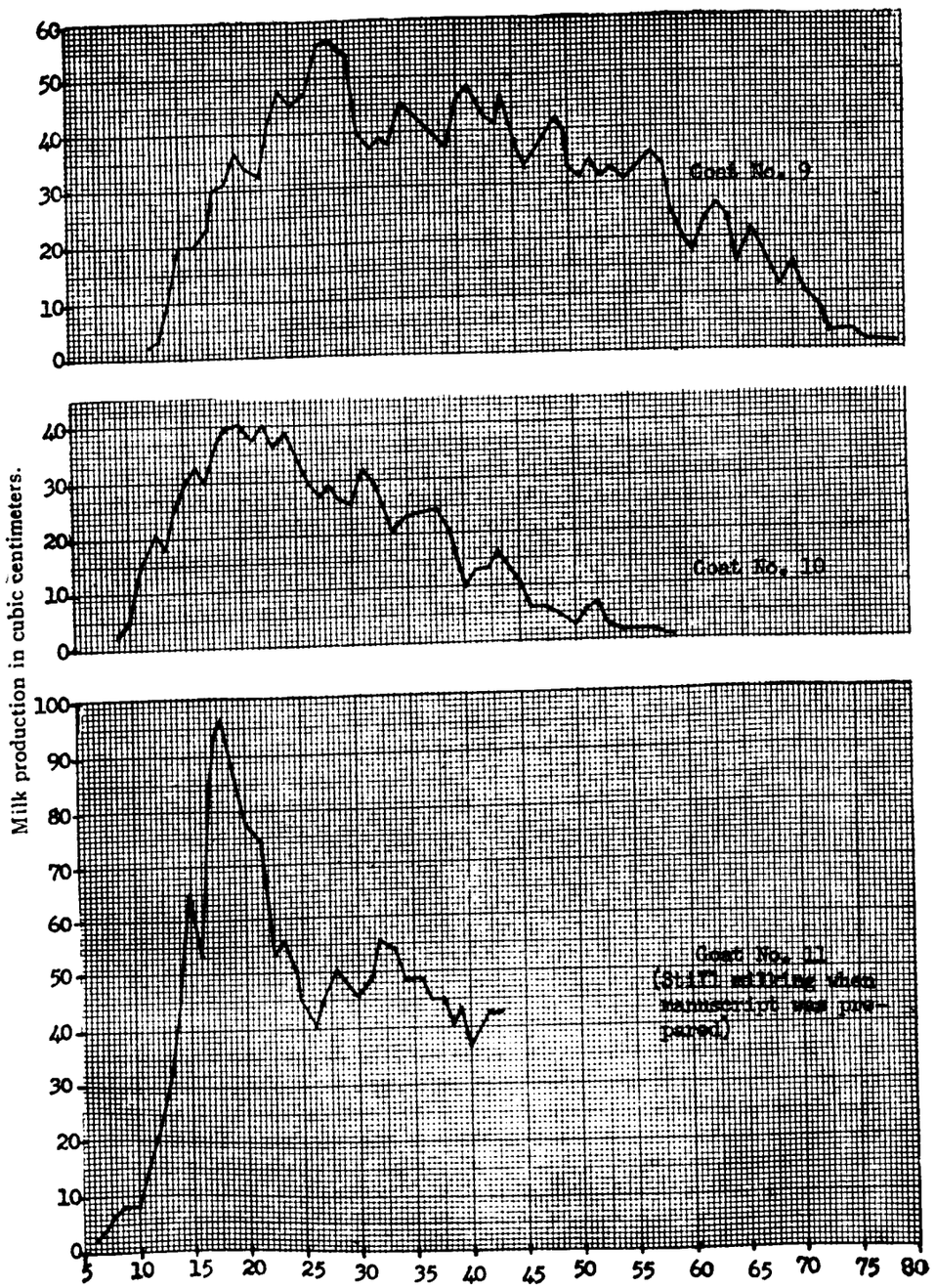

Fig. 2—Graph showing the milk production curves of dry goats.

Goat No. 9 produced milk two days after receiving the tenth injection, with a yield of 1 cc. for the first few days. High productions were obtained on the seventh, the tenth, the fourteenth and the eighteenth day. The highest milk production record was 55 cc. on the eighteenth to the twentieth day of lactation. The production declined with intermittent rise and fall of milk secretion daily until the sixty-eighth day when the animal was almost dry again.

Goat No. 10 came into lactation on the eighth day, two days before the last injection of 1 mg. of stilbestrol. Its milk production was high on the fifth, tenth, fourteenth and sixteenth days of lactation. The maximum yield was 40 cc., which was recorded on the twentieth day of lactation. The milk production lasted for a period of fifty days. The character of the production curve was like that of the dry Goat No. 9.

Goat No. 11 gave a more impressive response to the treatment. Six days after the first injection of 1 mg. of the drug, milk could be expressed from the mammary gland. An initial amount of 3.5 cc. was recorded on the first day of milking. On the eighth day, the milk yield was 65 cc., followed by a sudden drop the next day. Then an increase was observed on the tenth and eleventh days, when the milk yield was 83 cc. and 95 cc. respectively. Apparently, 95. 5 cc. of milk was the peak of production of this animal. The production curve then gradually declined up to the nineteenth day, after which there was intermittent rise and fall of milk secretion. The actual duration of lactation of this animal could not be determined, because, of urgent necessity, the experiment was terminated and the manuscript thereof prepared. The animal was still producing then at least 50 cc. of milk daily.

In this study, doses of 1 mg. and 2 mg. of stilbestrol injected daily for ten days were found to be lactation-stimulating. They produced the same effects as the 0.25 mg. of the same drug given daily for ninety days by Lewis and Turner (8), who claimed this to be the optimum dose in stimulating lactation in virgin goats. The results of the present study seem to indicate that relatively large doses administered for short periods have the same effects on virgin goats as the small doses administered for a long time.

It should be stated that the goats used in the present study were not of the dairy breeds like those used by Lewis and Turner (4). This may explain the difference between the amounts of milk yield obtained in the present work and those recorded by these investigators. The nervous and sensitive temperament of some of the native goats used may also account for the lower milk production.

According to Mixner, Meites and Turner (11), there is a possibility of stimulating more the growth of the milk gland with the use of 0.5 to 1 mg.

of stilbestrol at the expense of lactation, while a dose of 0.25 mg. would result practically in the stimulation of lactation. Our observations seem to contradict this view.

We have observed that the enlargement of the udder was very marked in the dry subjects, while in the virgins, there was hardly any difference in size compared with that of the controls. Only in one virgin female (Goat No. 2) was slight enlargement of the udder appreciable. It is apparent from our observations that the virgin goats whose mammary glands are small and practically undeveloped for actual milk secretion produced much less amount of milk under the influcence of stilbestrol than the dry subjects whose udder was more developed and had produced milk formerly.

Mixner and Turner (10) claimed that a considerable amount of milk secretion could only be realized when there is a well developed mammary gland present and where the lactogen content of the pituitary is in great amount. It may be safe to state that since the dry animals had been in milk formerly, larger amounts of milk secretion may be induced with stilbestrol injection because the udder had fully developed and had functioned previously. On the other hand, the virgin goats may not give the same response as that expected from the dry subjects due to the undeveloped condition of the mammary gland.

According to Patersen (12), other factors besides a completely developed mammary gland are essential in the stimulation and maintenance of lactation. Such factors as the internal secretions of the adrenals, hypophysis and the thyroids play an active role in this physiological phenomenon. Lewis and Turner (8), however, had the notion that the lactogenic hormones of the anterior pituitary must be responsive to stilbestrol in order to induce milk secretion. Similarly, Peeters *et al.* (13) believed that the anterior pituitary, once stimulated by small doses of stilbene, causes the production of strong hormonal secretions (prolactin and glutropin), which are supposed to be indispensable in the growth of the mammary gland as well as in the production of lactation. These views may explain the difference in milk yield among the dry goats studied which possessed practically the same sized udder.

Little can be said of the effect of stilbestrol on the weights of the animals observed. There were only slight differences in weights before and after the administration of stilbestrol in virgin goats, compared with those of the controls. These small differences were believed to be due to the natural growth of these immature animals, and not to the effect of stilbestrol injection. Lewis and Turner (8), however. observed gain in body weights of goats during continuous administration of the drug for nine and one-half to seventeen months. They used young animals for this purpose, and claimed no adverse effect on the health of the animals treated.

In the case of the dry animals, there was observed slight decrease in body weight. This decrease occurred when the animals under treatment were in their height of milk production.

Summary and Conclusions

A study on the effects of diethylstilbestrol on native virgin and on dry mature goats is herein reported.

It has been shown that the administration of 1 mg. and 2 mg. doses of stilbestrol fairly stimulated lactation in virgin as well as in dry mature goats.

The administration of the drug in virgin goats resulted in slight enlargement of the udder. In dry mature goats, the enlargement was more marked, and the amount of milk produced greater, than in virgin subjects.

Acknowledgment

The writers wish to thank Mr. Park E. Green, general manager of Squibb and Sons, Inc., Manila, for his kind help; Dr. A. Montaire of the SPCA, for the use of a dry mature goat under his charge; and Mr. F. Laredo of Lucena, Quezon, for the use of one virgin goat.

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THELAZIA BUBALIS N.Sp. FROM AN INDIAN BUFFALO (*BOS BUBALIS*)

By

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The species of Thelazia so far recorded in bovines in India is *Thelazia rhodesii* (Desmarest, 1828) only. Other species known to occur in this country are *T. callipæda* (Railliet and Henry, 1910) in dogs, *T. lacrymalis* (Gurlt, 1831) in horses and *T. leesei* (Railliet and Henry, 1910) in camels.

During routine diagnostic examination of clinical materials, helminths collected from the conjunctival abscess of a buffalo calf, aged 6 months, were found to reveal certain morphological peculiarities not associated with the known species of Thelazia, and hence the opportunity is taken to record this new species.

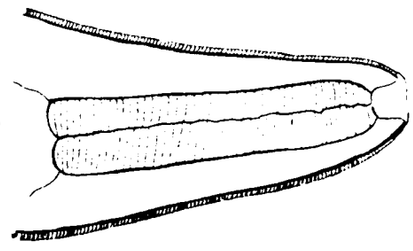
The collection contained six very small, slender, whitish coiled worms comprising of five females and one male.

Description:—The worms are slender and of almost uniform thickness, slightly narrowing towards the extremities. Tail end is slightly curved ventrad. Annulations of the cuticle are extremely fine. Oral opening leads into a shallow cup-shaped buccal capsule, broadest at the anterior end. The buccal capsule is followed by a short oesophagus, the length of it varying from 0·25 to 0·275 m.m.

Male:—The worm is 6 m.m. long and slightly shorter than the female but of almost the same thickness. The tail is blunt, measuring about 0·06 m.m. There are 11 pairs of preanal and 2 pairs of postanal papillae. The left spicule is long and slender measuring about 0·8 m.m., while the right is short, comparatively broad with a trace of alar expansions measuring about 0·15 m.m.

Females:—These are about 6.5 to 7·8 m.m. long and 0·25 m.m. thick. Tail is short and blunt measuring about 0·125 m.m. with a single short papilla near its tip. The uterus is found reaching almost the anal opening. Vulvar opening is found about 0·9 m.m. from the anterior end. Eggs in the uterus are oval, thick shelled, 0·15 m.m. long and embryonated.

THELAZIA BUBALIS N.Sp.



A. Head End. B, Tail End of Male. C. Tail End of Female.
(X 270)

THELAZIAS OF DOMESTIC ANIMALS

Name of Species	Host	Location	Locality	Gross Length in mm.		Length of Oeso.	Nature of Cuticular Striations	Shape of Buccal Capsule	Length of spicule		Length of the tail	Distance of Vulva from anterior end
				Male	Female				Lt.	Rt.		
T. rhodesii (Desmarest 1828)	Cattle Buffaloes Sheep & Goats	Lachrymal duct and Conjuncti-val Sac	Cosmo-politan	8—12	12—18	.54—.6	Coarse	Widest in the Middle	.75 To .85	.115 To .13	—	.9 To 1
T. gulosa (Railliet & Henry 1910)	Cattle	Eye	France & Sumatra	6—9	11—14	.3—.32	Relatively Fine	Widest at Front	.99 To 1.025	.19 To .125	—	.45 To .5
T. alfortensis (Railliet & Henry 1910)	Cattle	Eye	France	?	7—11	.28—.35	?	Cylindri-cal	—	—	—	.4 To .5
T. skrjabini	Cattle	Eye ?	—	—	—	—	—	—	1.13 To 1.85	.82 To 1.25	—	Less than .9
T. lacrymalis (Gurlt, 1831)	Horses	Lacrymal duct & Aqueous Humour	Cosmo-politan	8—12	11—18	.32—.4	Relatively Fine	Widest at the Base	.17 To .19	.13 To .14	—	.56
T. callipaeda (Railliet & Henry 1910)	Dogs	Conjuncti-val Sac & under Nictitaing Membrane	Cosmo-politan	.7 To 11.15	7—17	.67	Fine	Widest Antr. Third	1.87 To 2.42	.12 To .16	.045 To .094	.55
T. californiensis (Price, 1930)	Dogs Sheep Goats Cat	Do	U. S. A.	12 To 13	15 To 17	.566	Coarse	Widest at Front	1.5 To 1.7	.15 To .117	.12 To .13	.8 To 1.0
T. leesei (Railliet & Henry 1910)	Camels	Vitreous Humour	Cosmo-politan	12	15—21	.29 To .335	Fine	Narrowed Gradually in Front	.34	.105	—	.425 To .440
T. bubalis (Chari & Alwar 1952)	Buffaloes	Conjuncti-val Sac	India	6	6.5 To 7.8	.25 To .275	V. Fine	Widest at Antr. End	.8	.15	.125	.8 To .9

Discussion: The tabulated statement of the various measurements of all the species of Thelazia recorded in domestic animals reveals that the one under description has certain important morphological differences from the known ones, thus necessitating the creation of a new species to accomodate it. This differs from *T. rhodesii* in its gross length, the nature of cuticular striations, the shape of the buccal capsule and the length of the oesophagus. But this bears a resemblance to *T. rhodesii* in the length of the spicules and the tail only. It resèmbles *T. callipæda* in its comparative shortness and fine striations. But the other characters differ to a great extent. To *T.gulosa* (Railliet and Henry, 1910) it has comparatively perhaps the greatest resemblance viz. in the gross length, the length of the oesophagus, the shape of the buccal capsule and the length of the spicules. But the resemblances are not absolute and, added to these, the position of the vulva differs. Hence, taking into consideration all these significant differences, it is proposed to name this new species as ***Thelazia bubalis*** after the animal from which these spirurids were recovered.

Diagnosis:—The important morphological characters are:

1. Very short length
2. Extremely fine cuticular striations
3. Cup-shaped buccal capsule widest at the anterior end
4. Significant differences in the measurements of various structures

Host:—Buffalo.

Location:—Conjunctival sac.

Locality:—Udayagiri Taluq, Nellore District, Madras State. (1952)

(Type specimens are kept in the Parasitology Museum of the Madras Veterinary College)

Acknowledgment

Our thanks are due to Sri D. Seetharamamoorthy, B.V.Sc., Touring Veterinary Assistant Surgeon, Udayagiri, for the valuable collection of these extra-ocular worms and to Sri M. R. Jambulingam, the College artist, for the drawings.

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JAMNAPARI GOATS

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29577

'Jamnapari' means across the Jumna. The breed of Jamnapari goat derives its name from the place where it is found; although the river Jumna flows right from Himalayas down to Allahabad, this breed is localised in a very small tract in the district of Etawah only. It is wrong to call these goats from other parts of India Jamnapari.

Boundary of the country:—This small tract where this breed of goats is found is bounded on the northern side by the Jumna river, which in this district continues windingly in a south-easterly direction, till it describes a remarkable curve before it unites with Chambal at Bhareh. On the southern side there are the rivers of Chambal and Kuwari. The river Chambal is exceedingly liable to sudden and heavy floods owing to the steep gradient of its bed before it debouches on the alluvial plain. Its waters are remarkable for their crystal like clearness. It has steep banks or bluffs which hem it on either side and some inlying bays into which water rushes, when swollen, through the breaks or gaps in the bank. On the west this breed is only found in the Tahsil of Bharthana, while in the east only upto the place where the rivers Jumna and Chambal unite.

Geography of the country:—This area is a high, broken and rough country formerly known as 'Janibrast' and is little more than 500 ft. in height. It comprises the land lying between the Jumna and the Chambal rivers, locally, known as 'Par', and those on the right bank of the Chambal between it and the Kuwari. This upland is bordered on either side by a net work of intricate ravines beyond which there exists but little alluvial land. The land is so broken by the tracery of ravines which flank the streams that only the thinnest stretch of upland fit for cultivation is left in the centre. This tract is just a labyrinth of ravines. The entire tract abounds in trees like Babul, Raionj and Karoand with many kinds of other small trees and shrubs which supply excellent grazing for goats.

Climate and Rainfall:—The climate is hot and dry. Hot winds blow as a rule steadily and strongly from the commencement of April till the breaking of rains. The average rainfall is about 32 inches.

Inhabitants:—The tract is inhabited mostly by Ahirs and Thakurs; other castes are also found. Mohammedans are few in number. The goats are reared by all the castes alike.

History of the goats in general and the breed in particular:—Goats were one of the first animals domesticated by man. Like the goats in general,

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the history of Jamnapari breed of goats appears to be as old as that of others. From descriptions given in Manusmriti (Adhyaaya 3, Slok 271) it seems that this breed existed even in those days and was greatly esteemed then.

Characteristics of the breed :—The Jamnaparies which number on the whole about 10000 are a large dual purpose breed combining meat and milk qualities. They resemble the Nubian breed of goats. The chief characters are as follows :—

They are tall having long, wide, pendulous ears and a definitely pronounced Roman nose. They have a large amount of long, thick 'feathers' on their buttocks. They carry immense udders, with long teats. They have no specific colour markings and, as a matter of fact, the animals are not bred to any standard colour or marking : but fawn and white are mostly found. Black and white are also seen.

The average length of an adult male from nose to root of the tail is 54 inches, height from withers to hoof is 38 inches, weight about 160 pounds. Female length is 45 inches, height 34 inches and weight 120 pounds.

They are pretty animals and huge in size. There exists a definite milking type in them, although few animals resemble to that type. There is a type known as 'Ram Dhan Type' and there are evidences to show that animals of this type have given as much as 13 pounds of milk per day. I am of opinion that, if this type is developed in right earnest and on scientific lines, they can become famous as very good milkers. Ordinarily, however, the average yield is about 4 to 5 lbs. a day, if milked completely.

Purpose for which these animals are bred :—These animals are bred in this area for manuring the fields and to provide the owner with a ready money from the sale of a few animals to the butchers. Only that amount of milk required for a household is milked and the rest is left to be suckled by the kids. A few, however, use the milk for butter and khoa making.

Age when first mated :—Usually, people do not like to have their she-goats mated until they are about 18 months old or 2 years of age.

Export and the present scheme :—With the continuous export of good animals from this area to the foreign countries during the latter part of the last century and in the beginning of the present century, the breed has deteriorated. The Government, realising this fact, imposed a ban on the export of these animals and at the same time started a scheme for the improvement and development of this breed in 1938.

The best available males and females of the breed were picked up, numbered and registered. The owners are given a subsidy at the rate of Rupees two per month per she-goat and Rupees three per buck to maintain them. The subsidised animals are very frequently inspected by the staff of the

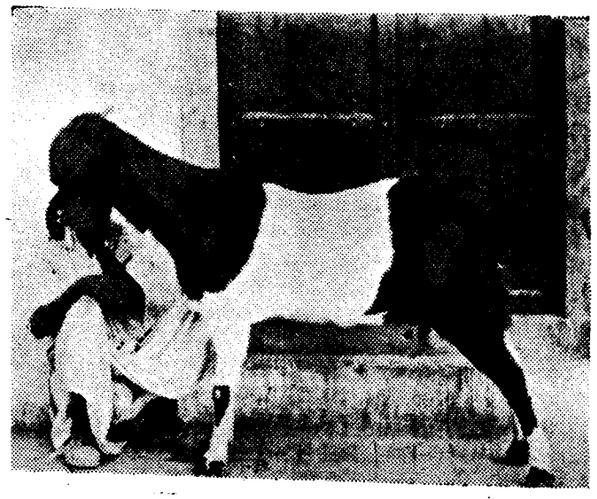
department and lectures are given to the breeders on various subjects connected with the goat husbandry. Every year a goat show is held at Chakarnagar in which prizes are awarded to the winners. There has been a considerable improvement in the quality of these animals since the introduction of the scheme.

Feeding and foods available :—The goat is a restless animal and loves to roam about from one place to another in search of fresh food, nipping tender leaves and shoots and biting off tender buds and barks of trees. It is this innate love of destruction that makes the goat the sworn enemy of the forester and the gardener. But it is a mistaken belief that this is necessary for goats to thrive. The goats love grazing and still more brousing, and require a constant change of pasturage. They soon become ill if repeatedly put on the same plot of land. They, however, do not care for a rich pasture. They hate wet, even if it be a slight shower. All leguminous plants are eaten by them, but not voraciously. A succulent herbage, though good for the production of milk, does not appear to be appreciated by these animals, which give preference to hard, bitter and woody kinds of plants.

I believe there exists no animal that eats so great a variety of food as the goat, nor any which soon tires of one thing or is more fastidious in regard to the cleanliness and quality of each article. The tract is so rich of food for goats that plenty of it is always available throughout the year. The chief foods available are :—

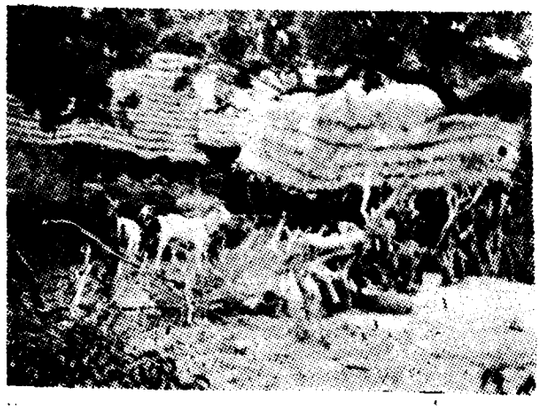
	Local name		*Botanical name*
1.	Babul	...	Acacia arabica.
2.	Raionj	...	Acacia liucaphlia.
3.	Chhainkur	...	Prosopis spicigera.
4.	Kairil	...	Capparis aphylla.
5.	Hins	...	Capparis horrida.
6.	Makoi	...	Zizyfhus Oeuoplia.
7.	Karonda	...	Carissa opaca.
8.	Pilwa	...	Glycosmis pentaphylla.
9.	Arusa	...	Adhatoda Vasica.

JAMNAPARI GOATS



Black and white goat.

She goat with kids.



Goat House.

Jamnapari goat.

EGG PRODUCTION IN INDIAN FOWLS*

"Daughter Mother Comparison"

BY

S. G. IYER,

Indian Veterinary Research Institute, Izatnagar, U. P.

Introduction:—By egg production is meant the capacity of a pullet to produce eggs and is measured by the number of eggs laid by her for a full period of one calendar year from the time she commenced to lay. It depends upon intrinsic as well as extrinsic factors either one of which by itself being incapable of giving the desired results. In fact it is the genetic make-up of the bird which is responsible for the number of eggs she is potentially capable of laying; but maximum production can be obtained when the environmental factors such as sunlight, housing, feeding, management etc. are at best. The role of environment is conspicuous from the fact that good feeding and management will enable to increase egg production from 80-90 eggs per year to 150 to 160. The external appearance of the bird as evaluated by body measurements, condition of the comb, vent and abdomen, moulting and pigmentation changes will indicate a past, present and future egg production. But these will not enable one to predict whether a bird can be classed as a good breeder or not.

With the advent of trapnest during the beginning of this century there came a new era in poultry genetics. The trapnest offered a measure of the laying performances of hen during a given period of time. The breeding and development of utility classes of poultry from the various breeds and varieties were the direct outcome of trapnesting.

Literature

The first attempt at a State institution to develop egg production through selective breeding was that of Maine Agricultural Experiment Station by Gowell (1902) working with Barred Rocks for over nine years. Hens were selected for breeding on the basis of their first year egg records and the male birds on the basis of their dams record. No significant improvement in the average egg production of the flock could be accomplished by dint of this method. The failure to produce an increased level of egg production among the birds raised in each year was subsequently recognised to be due to variations in the breeding worth of individuals despite their own performances.

While egg production is an inherited characteristic the exact mode of inheritance has not been studied in a complete manner.

Indian Poultry Gazette, July 1951.

According to the Goodale-Hays theory of egg production (1918), the first year egg record of a hen is governed by five principal characteristics. These include early sexual maturity, high rate of laying, non broodiness, non-winter pause and persistency of production. The pullet year record is highest in the case of a bird which begins to lay early in life as well as in the season maintaining a high rate of production during the first 6 or 8 months and continue to lay despite the commencing moult when poor producers cease to lay. Much prominence is given to the pullet year production by poultry keepers all over the globe, under the belief that the higher the first year egg production, the more number of eggs will her progeny lay. Virtually, the first year performance of a hen represents her breeding worth. However, the work at the National Agricultural Research Centre, Maryland (1935) has proved beyond doubt that selection of birds on the basis of the first year records is but of limited value since the character concerned is a quantitative one easily influenced by environmental factors.

Progeny testing of breeding stock with a view to effect improvement in egg production has been used successfully in the breeding of Rhode Island Reds at the Massachusetts Agricultural Experimental Station where remarkable results have been reported. The use of progeny testing for improving the egg production in White Leghorns has been accomplished by Warren (1932) and many other American workers. An index value designated as the prepotency index has been devised for Dairy Cattle by H. D. Goodale in 1927. A modification of this index has been utilised in poultry breeding. The index of the sire is calculated as follows:—half of the difference in egg production between dam's and daughter's average is added to the latter if the daughter's average is above that of the dam's whereas, if the daughter's average is below then half of the above mentioned difference is subtracted from the daughter's average. The figure thus obtained represents the sire index. By use of the index it has become possible to compare cocks mated to females by varying production. Usually the breeding pen is made of ten hens and one cock bird and as the sire is common to all the daughters raised from this breeding pen, a comparison of the breeding worth of the different dams is feasible when the production performance of the dams is nearly the same; the comparison of egg production of daughters with those of their dams will reveal the true breeding value of the male. Work of this nature in Indian Union is still in its infancy owing to handicaps of short span of life, prevalence of disease, deterioration in the physiological character as fertility and hatchability and above all economic reasons. In spite of these difficulties, progeny testing of sires is the only potential tool in the hands of the poultry breeders in order to achieve their goal.

Experimental

As a preliminary step to progeny testing, attempts have been made in the breeding of Indian (local) strain of fowls maintained at the poultry farm attached to the Poultry Research Section, Indian Veterinary Research Institute to increase the general level of egg production by a combined system of selective breeding, proper feeding and ideal management practices. In order to further augment the production characteristics of fowls, sire index and testing of breeders were undertaken during the period 1946 to 1949. The female breeders were selected on the basis of their first year production. Selection of male birds was based on 150 egg record of dam in each generation and in the present work only one pedigreed cock bird has been tested. During the hatching season extending from December 1947 to March 1948 all the progeny were hatched out and wingbanded and records of their pedigree maintained. Artificial brooding was practised from 0—8 weeks at the end of which the sexes were separated, the female chickens reared under semi-intensive system, in groups of 40 to 50, till 24 weeks of age. At the completion of this age, the pullets were handled, transferred to laying pens and trapnested for a full period of one year from the date of their first egg. Culling was avoided as far as possible to enhance the value of records. The feeding and management practices were kept constant as far as possible. No new blood was introduced during the period of experiment. Since the real breeding worth of birds can be assessed by means of what quality progeny they throw out, in the first instance a comparison of daughter's performance in relation to those of dams is made out as shown in Table 1.

TABLE 1

Daughter—Dam Comparison of egg production.

Sire No. 2163

Sire Egg record 147

Dam No.	1	2	3	4	5	6	7
Dam's production.	172	171	150	134	133	115	114
Serial Number of daughters.	*Individual egg production record of daughters.*						
1	143	126	174	150	142	131	185
2	141	124	102	142	130	118	167
3	115	121	75	127	84	112	142
4	91	118	76	124	24	106	125
5	...	...	...	119	...	95	123
6	...	...	...	115	...	94	123
7	...	...	...	114	...	90	117
8	...	...	...	111	...	89	103
9	...	...	...	81	...	45	68
Daughter's Average.	122.5	122.3	106.8	120.4	95	97.7	128.1

It will be seen from Table 1 that the breeding worth of seven dams, varying considerably in record to their first year production the lowest and the highest being 114 and 172 respectively, has been determined by mating to a common sire No. 2163 at one year old.

In the case of the each of the 4 dams only four daughters could be raised while from the remaining three dams nine daughters were raised in each case. This may be attributed to differences in the relative hatchability results of the different dams, a point which sooner or later will have to be considered at greater length. The daughter's average in the case of different dams ranged from 95 to 128.1. As all the dams were mated to one sire with an egg record of 147 the superior breeding worth of dams No. 7 and 4 is obvious, in comparison to the poor breeding worth of the dams No. 5 and 6. It is also observed that with the exception of dam No. 7 the daughter's averages in the case of all the other six dams were significantly lower than their respective dam's production which may be attributed to the influence of the sire. Another interesting observation in the case of dams 1 and 2 is that their production was nearly the same and similarly the daughters of both these dams gave the same averages suggesting that the sire had indeed a marked depressing effect on the egg production of their progeny. From the foregoing the recommendation is that Dams No. 4 and 7 should be used liberally as long as they live and the rest be preferably eliminated from the farm. It is therefore necessary that the work should be extended to testing more sires of the same strain for purposes of spotting out best sires.

Summary

With a view to augment the level of egg production in a variety of Indian fowls, the hens used as breeders mated to a pedigreed cock have been analysed as regards their breeding worth by trapnesting all their daughters during their pullet year. Thus the breeding worth of the different dams has been determined. Two out of the seven dams mated have proved to be of superior breeding worth and have been used as breeders in the subsequent year. The results have also shown that the selection of hens for the breeding pen on the basis of their pullet year production is not a true criterion that their daughters also will lay well as dams with moderately high first year egg production. A third to one-half of the total number of daughters from each dam proved to be having high egg records. The egg records of the individual dams ranged from 114 to 172 and similarly in the case of the daughters the averages varied widely between one group of daughters and another, the lowest was 95 and the highest 121.1. In the majority of cases the lowering of the daughters average egg record may be attributed largely to the influence of the sire, necessitating the extension of progeny testing of more number of sires in the same strain, the cock bird representing over 50% of the breeding pen. Generally the larger the number of progeny from each of the hens, the greater is the degree of reliability in the selection of superior families.

COCCIDIOSIS IN CATS AND DOGS IN BOMBAY

BY

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&

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Information regarding coccidiosis in cats and dogs in this country is limited to observations made by Aiyar (1937), Cooper and Gulati (1926), Sen (1932), Knowles & Dasgupta (1934), in Bombay, Mukteswar, Bengal and Assam respectively, although a number of species of Eimeria and Isospora have been known to occur in the epithelial and sub-epithelial tissues of these animals causing at the most slight inconveniences to the host, but never resulting in a recognisible clinical syndrome unless otherwise infected with some other parasites or parasite (Helminthic or Protozoon). An accurate knowledge of the incidence of infection prevailing in a particular area cannot be obtained unless suitable laboratory methods are adopted to disclose the unsuspected parasite. In the past, many cases went undiagnosed due to inadequacy of laboratory facilities. And, therefore, a thorough examination of the faeces of dogs and cats presented for treatment at the Bai Sakarbai Dinshaw Petit Hospital for Animals, Bombay, was undertaken to find out the incidence of these parasites. Up-to-date nearly 4% of dogs and about 50% of the cats examined were found to harbour coccidia without showing any clinical symptoms of coccidiosis.

The species that cause coccidiosis in cats and dogs belong to two different genera viz. Isospora and Eimeria, which differ from each other in the details of the development of the oocyst. Both the genera have got eight sporozoites but in Eimeria they are distributed in four sporocysts each containing two sporozoites but in Isospora the same are distributed equally in two sporocysts.

The principal characters used in distinguishing different species of coccidia affecting dogs and cats are size and shape of oocyst and sporocyst, the presence or absence of micropyle, presence or absence of oocystic and sporocystic residuum, the time taken for maturation of oocyst and the site of infection.

As a result of examination conducted for the last four years, *Isospora rivolta*, *Isospora felis* and *Eimeria canis* have been encountered. While *Isospora rivolta* and *Isospora felis* have been found on several occasions, *Eimeria canis* was available only once, the infection being very mild.

Isospora rivolta, (*Grassi*, *1878*):—Knowles and Dasgupta (1934) and Aiyar (1937) recorded this parasite from Bengal and Bombay from cats and dogs.

This had been found in a number of dogs during the course of routine work at Bombay. It is more or less oval in shape but one end may be a little pointed. Not infrequently rounded forms were also met with (Fig. 1). Micropyle is

Fig. 1. Isospora rivolta.

Fig. 2. Isospora felis.

absent. The sporocysts are elongate with rounded ends each containing four sporozoites which are highly refractile. There is a large sporocystic residuum which is also highly refractile. The oocysts measure 19-25u x 18-20u,

sporocysts 14-15u x 12-14u, sporozoites 10-12u x 4-6u. Sporulation takes place under laboratory conditions within twenty four hours when cultured in 2. 5% Potassium bichromate solution. Wenyon and Sheather (1925) have noted the probability of reproduction and development taking place in the sub-epithelial tissue.

Isospora felis (Wenyon 1923). (Fig. 2). Knowles and Dasgupta were the first to record this species from Bengal and found fourteen out of 21 samples examined to be infected. They found two types of oocysts, one small and the other bigger, the bigger measuring 35-45u x 27-36u which are to represent *Isospora felis*.

This is the largest species of Isospora affecting cats and dogs but this species has been noticed only in cats so far at this place.

Isospora felis is distinguished from *Isospora rivolta* by its larger size. It is egg shaped with a distinct neck on one side of the pointed end. According to Wenyon, the developmental stages occur in the epithelial cells of the villi of the small intestine, and also caecum. The oocysts measure 30-35u x 45-50u, sporocysts 13-15u x 15-20u, sporozites 0.5-0.9u x 10-15u. There is a large sporocystic residuum. When the oocysts are passed they are found to be in the process of maturation and complete sporulation takes place by keeping the faecal sample over-night in 5% potassium bichromate solution.

Isospora bigemina (Stiles 1891). This has not been recorded so far in this State.

Eimeria canis (Wenyon, 1903). This has been recorded only once. The oocysts measure 15-45u x 11-25u and are ellipsoidal in shape. The micropyle is obscure but can be detected in some of the oocysts.

There are very few records of this parasite in this country and it may be present along with Isospora infection.

Pathogenicity and symptoms:—Lee (1934) has worked on the pathology of coccidiosis in detail by artificially infecting some of the dogs. According to him the pathological changes are confined to the small intestines. The lesions produced are due to desquamination of epithelial tissue and consequent haemorrhage. The parasite is localised below the nucleus of the parasitised cell. But the predominent symptoms of coccidiosis are rapid progressive emaciation, anemia, weakness and bloody diarroea. The pathogenicity depends upon the severity of the infection and the resistance offered by the animal. None of the symptoms mentioned above could be observed except vomition and diarrhoea.

Coccidia cause great enonomic loss to the domestic animals especially to fowls, cattle and rabbits although their effects are negligible in dogs and cats. These are mostly the parasites of epithelial cells of intestine although some species are found in the sub-epithelial tissue and liver.

Treatment :—Since all the cases that were examined for coccidiosis were also found to have either hookworm or ascarid infection, treatment was only confined to the parasitic worms leaving coccidia unaffected. Spontaneous recovery is generally the rule and the cases of death are due to other secondary infections. Food and proper hygienic conditions in affected animals bring down the number of oocysts in the fæces.

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T. evansi in Chick embryo

Fig. 1. Freshly hatched-out infected chick.

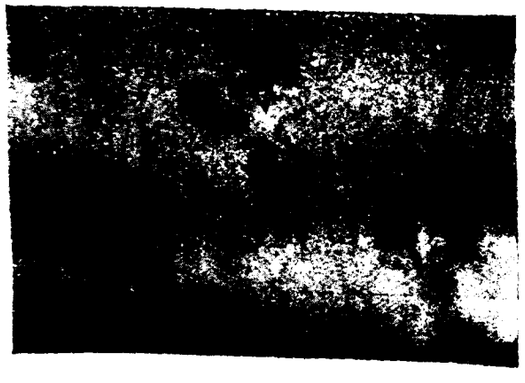

Fig. 2. Photomicrograph of the peripheral blood showing *T. evansi*.

CULTURAL EXPERIMENTS WITH *TRYPANOSOMA EVANSI* IN CHICK EMBRYO—A PRELIMINARY REPORT

By

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(Received for publication on 13-8-52)

Biocca (1938), Acanfora (1939), Longley *et al* (1939) and Hallauer & Kuhn (1940) successfully infected chick embryos with ***Trypanosoma brucei***. Longley *et al* (1939) cultivated ***T. rhodesiense, T. equiperdum, T. hippicum, T. lewisi*** and ***T. evansi*** also in the same medium but chicks showing trypanosomes in the blood did not hatch out. Ganapati (1948) infected chick embryos with *T. cruzi* but all of them died before hatching. Van Den Berghe (1941, '43) was able to get chicks hatched out revealing ***T. evansi*** in their blood. In India, even though Naik (1950) claims to have successfully grown *T. evansi* in chick embryos, trypanosomiasis in hatched-out chicks has not been reported by him.

Hence, this preliminary note is written to record our observation of trypanosomiasis in hatched chicks, after inoculation with ***T. evansi*** into the chorio-allantoin membrane.

Materials and methods:—Fertile eggs from White Leghorn fowls were utilised for the experiment. After 10 days of incubation, blood revealing a heavy infection with ***T. evansi*** drawn directly from the heart of a guinea-pig by ripping open the chest, was inoculated by the standard method of egg inoculation. The only modification adopted was that, at the site of inoculation, the shell alone was removed leaving the membrane intact. These eggs were incubated afterwards at 101°F. Out of a total of 18 eggs thus incubated, 15 embryos died, mostly on the 18th day, ie. a week after giving the infection. Three chicks hatched out and, 6 of these, two had ***T. evansi*** (vide Plate No. 6. Fig. 1) while the third was free from the infection. Both the infected chicks had to be helped out of the shells. They were weak, sickly and maintained sub-normal temperature ranging from 99°F. to 100°F. One lived for 4 days revealing trypanosomes in its blood all along (vide Plate No. 6. Fig. 2) and the second one died on the day of hatching itself.

Further details of the cultural work will be published later.

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Editorial

CEREBRO-SPINAL NEMATODIASIS

We are in a scientific age. Discoveries of an almost unbelievable kind are being announced from time to time. Our knowledge of medicine is advancing with astounding rapidity that one becomes a back-number, as it were, over-night. Concept of diseases is undergoing revolutionary change and the tangled skein of symptomatology of some of the obscure affections gets easily unravelled by these new discoveries. And so is it now with a disease of a neuro-muscular nature which has been a puzzle to the veterinarians for a long time past. Reports of a disease that has been till now loosely and vaguely described as lumbar paralysis, locomotor ataxy and paraplegia of unknown etiology in horses, cattle and goats have been published time and again in this country but its 'pathological descriptions do not suffice to depict the exact nature of the disease and the cause has not been found'. We have, therefore, great pleasure in inviting the attention of our readers to the special article published in this issue from the pen of Dr. Innes on what he and his colleague designate as Cerebro-spinal Nematodiasis. The article reveals an outstanding and remarkable neuro-pathological study of what has been hitherto a hidden disease baffling investigation. It also reveals the effect of a close liaison between the field workers and research workers, between the histo-pathologists and parasitologists and above all between the veterinarians in different parts of the world. According to Dr. Innes, 'the original work was in fact made by Japanese workers, the papers of which have been obscured because of the war and of the Japanese language'. Fortunately, the work was taken up by

Dr. Innes who in collaboration with workers in Ceylon investigated the disease known as lumbar paralysis of goats in Ceylon characterised by 'motor weaknesses and ataxia in the hind limbs only (or in all four), leading to swaying, tumbling, complete paralysis and there was nystagmus occasionally'. It was also reported that the onset of the disease which was afebrile was sometimes dramatically sudden or it was sub-acute. The mortality was great and even the few that recovered had residual effects. The investigation of this disease has been very arduous and laborious and great credit is due to the investigators for the patience with which they have worked in elucidating the causal factor. To quote the author 'In several goats from Ceylon, the whole nervous system was embedded in paraffin for section cutting, whole coronal slabs of the brain being cut, and transverse cuts with longitudinal ones being made of the entire spinal cord'. Such an intensive and painstaking study, unprecedented so far, has yielded fruitful results and it has shown the true nature of the lesion in the disease. To quote the author again: 'The total process is quite diagnostic and unlike the pathology of any viral, bacterial, protozoal, mycotic or toxic or deficiency nervous disease.....The essential pathological process is that of a focal encephalomalacia, which simply means softening of nervous tissue, and this may proceed to liquefaction and even cavitation in a few days. The lesion may be single, or there may be a few foci, but rarely are there disseminated changes'. These changes (which explain the neuro-muscular symptoms evinced by the animals affected) are caused, according to these authors, by the filaria *Setaria* wandering in an ***unnatural*** host. The normal host of the ***Setaria digitata*** is cattle and it does not cause any harm in them. But when the microfilaria are carried to other ***unnatural*** hosts by the intermediate insect vectors like mosquitoes, they wander about erratically, reach the central nervous system of the ***abnormal*** hosts and create disorders of the nervous system. The authors conclude that the symptoms manifested by the animal are only 'due to a mechanical traumatic effect due to the wandering of the worm in and out of nervous tissue'. They also admit the possibility of other nematodes behaving in a similar way and cause neural nematodiasis in abnormal and unnatural hosts. These conclusions are of far-reaching importance and should take us a long way in the handling of similar cases in this country, reports of which have been published fairly often. As a result of the investigation conducted so far, Dr. Innes has made a retrospective study of the other disease known as Kumri in horses in India and opines that that disease 'which has been a puzzle for well over 100 years may be tackled in a similar way'. He has also hinted at the possibility of the 'worm in the eye' cases 'being no more than an extension of cerebro-spinal nematodiasis complex with another location (the eye) and that the worms might indeed travel into the eyes from the nervous system through the optic foramen'. These views are similar to those expressed by some of the Veterinarians in this country for a long time past, as admitted by Dr. Innes himself, but unfortunately they have not been followed up. We do hope that, with the increased facilities available in the present scientific age, these problems will be taken up for intense investigation in this country ere long. The work of the Japanese research workers, of Dr. Innes and his colleagues has revolutionised the approach to the study of some of the unknown nervous disorders in animals and, may we also add, of human beings too.

INDEPENDENCE DAY MESSAGE

The fifth anniversary of our Independence was celebrated with great *eclat* on the 15th August 1952 throughout the country. Broadcasting to the nation on the eve of the Independence Day, Dr. Rajendra Prasad, the President, spoke as follows:

Another year has run out since we last celebrated the Independence Day. That has seen the country emerging out of the transitional provisions of the Constitution. With the general elections and the appointment of new Ministries in the States and at the Centre, the Constitution has come into force in its entirety. The general elections were an experiment in democracy on an unprecedented scale and the way in which those in charge and the millions of men and women who participated in them conducted themselves, encourages the sope that our infant-democracy is set on the right road and bids fair in course of time to justify its existence.

We have now got in our legislatures not only a very much larger number of representatives of the people elected on adult franchise, but also a large number of new faces, all with new hopes and aspirations to serve the country to the best of their ability. We have also got new Ministers taking up responsibilities all over the country, pledging themselves to devote their time and energy to the solution of the numerous problems facing them.

While we can justly congratulate ourselves on this achievement, this is no time to be complacent. The form has been achieved, but the substance has to be filled in, and this will have been achieved only when we have succeeded in tackling the problem of poverty, disease and ignorance. We cannot afford either to be jubilant before time or to be frightened and dismayed by the many and real difficulties that we have to overcome in solving these problems. Constructive effort on a scale as large and unprecedented as the general elections has to be undertaken to meet our prime needs. I have no doubt that we have the capacity to solve our problems if only we have the will and the determination as a nation to do so.

The food Situation

Take for example the question of food. At the bottom of the problem of hunger is the lack of sufficient food in the country. It is a paradox but nevertheless true that a country which claims to be, and is in fact, very largely agricultural, and which has known and practised not unsuccessfully agriculture for countless generatious, which has a rich fertile soil, plentiful supply of water both on the surface and underground, which has climate of all varieties suited for the growth and production of all kinds of grains and fruits, herbs and vegetables, should be deficit in food. Nature has been bountiful, but we are not utilising the bounties of nature or our own capacities to the best advantage.

Apart from the very large and gigantic multi-purpose river projects which have been taken in hand or are in contemplation but which will take time to implement and bear fruit, the deficit can be, to my mind, easily metby our people devoting a little more attention, a little more labour, a little more knowledge, a little more organisation to agriculture. Complete understanding and full co-operation between the agencies of Government and the people engaged in food production are necessary to bring about the best results. We cannot afford to import hundreds of crores worth of grain from year to year, and it must be the duty and the look-out of every individual to save every little particle of food that he can, to add every little particle to the production of food and to help in a just and fair distribution of it. We need to get rid of sloth and laziness, and to utilise our time and energy in productive work. The same considerations apply to other articles of daily necessity.

Need for "Freedom from Anxiety"

To enable us to meet our daily requirements of life, and to raise its standard, we need freedom from anxiety for all our people and good relations should subsist amongst different sections of us and with other countries, in particular with our nearest neighbours. We have people following different religions, speaking different languages, following many and varying customs, and complete understanding and toleration of each other and full freedom to each to live his own life and to rise to his fullest height without interfering with similar rights of others are essential. This in one word is what is meant by calling our State a secular State, and to-day it is obvious that the first condition not only of all progress, but also of our bare existence is peace based on mutual understanding. I, therefore, plead that we must all learn to live and let others live, none trying to dominate, none trying to exploit, none trying to humiliate others. This can be secured only on the basis of non-violence which the Father of the Nation taught us as of yore.

International Relations

In a world seething with discontent and disruption, doubt and suspicion, we have to play our humble part for the maintenance of peace. We have no ambition except of being able to render service to our own people and also to others, however limited our capacity and however humble our services may be. We have won our freedom pursuing a novel and noble method. Our means have been as honest and ennobling as our ends. We owe it to ourselves and to others to proclaim our adherence not merely by words but also by our deeds to those high ideals which inspired us during the period of struggle for freedom. Our hands may shake, our feet may falter, but let not our vision be dimmed nor our determination to follow the truth be weakened. Let us make that resolve for the year which commences to-day.

Faith in moral and spiritual values

No nation can prosper, no people can hope to rise unless the individuals constituting it have a deep-seated faith in certain moral and spiritual values. A nation trying to emerge from prolonged bondage and suppression needs them all the more. It was, therefore, an indispensable and essential part of Mahatma Gandhi's work to base all his programmes of action—national no less than individual—on what he comprehensively called Truth. We cannot do less today when we have become masters of our fortunes and architects of our destiny.

Let each one of us examine his or her own life and activity and see how far he or she conforms in daily dealings to the ordinary standard that is generally accepted in society. We shall have served the country well if we

remedy the defects and remove the deficiencies and weaknesses, even though we may not reach the high standard aimed at by Mahatma Gandhi. Many of the ills that we are suffering from and many of the complaints that we constantly hear will have become things of the past, if we did this much.

Let each one of us appreciate and realise that individuals constitute the nation and the nation is and can be only what these individuals constituting it are. Pathetic faith in the Government being able to solve all our problems—national and individual, moral and material—for us is based on wrong appraisal of the strength and capacity of a Government and an underestimate of what the people can and have to do. It must give place to a robust consciousness and steady confidence that it is for us and up to us as a people to conquer all our difficulties and that we shall do so.

For this we need character, a character that will not easily and readily yield to temptations that beset us, that will be prepared to make sacrifices, that will stick to what is right despite overwhelming difficulties, that will enable one to enter into the skin of others and make their sufferings and sorrows one's own, that will be ever ready to give rather than to take. A nation of individuals with such character will itself be happy and prosperous and make others also happy and prosperous. Let us strive to be such a nation and make the Independence we have won a blessing for us and for all.

PRIME MINISTER NEHRU'S APPEAL

Unfurling the National Flag on the 15th August 1952 over the historic Red Fort, New Delhi to symbolise the achievement of Indian Independence on that day in 1947, Prime Minister Nehru called upon the people of India to work in a concerted manner for uplifting the "poor, down-trodden suffering millions in this country. We have to set about this big task not from the viewpoint of any province, or of one community or of one religion. The biggest duty, profession and religion of any person to-day is to strive to take the country forward, to serve the 36 crores of people, to uplift the poor, down-trodden masses and to wipe the tears from the eyes of the suffering people. It is our duty to see that no person in this country sheds tears of suffering."

"Our duty to-day," said Mr. Nehru, "is not to look back but to look forward, because ultimately we have to follow the voice which calls us to complete the tasks half completed and the work half done. But remember the work of a nation is never completed. We may complete a thousand things, yet a thousand more will remain to be done."

"The worth of our work ultimately will be judged by the extent to which we succeed in drying the tears from the eyes of suffering people," he added.

Notes and News

The Indian Veterinary Research Institute, Mukteswar.—The Government of India have decided to get the Associateship of the Indian Veterinary Research Institute, Mukteswar, recognised as equivalent to the M.Sc. degree and the rules for the grant of Associateship have been revised.

Some of the Indian Universities have allowed research students working at the Indian Veterinary Research Institute to submit thesis for post graduate degrees on the basis of the research work done by them at the Institute. A diploma of Associateship of Indian Veterinary Research Institute is also granted to candidates who carry out research work of originality and merit at the Institute for a period of not less than two years and submit within six months of completing the study thesis for approval by the Council of the Institute, states a Press note from New Delhi.

* * *

Meat Hygiene Expert.—Bombay will have the benefit of the services of Dr. Horace Thornton, a U.N. expert on meat hygiene, to advise the Municipality on slaughter houses and the marketing of meat if the Corporation approves the Municipal Commissioner's suggestion to this effect.

The Standing Committee of the Corporation, on Wednesday, agreed with the Commissioner's proposal that it would be advantageous to consult Dr. Thornton when he visits the city and obtain his advice on several matters connected with slaughter houses and marketing of meat especially when the proposal to shift the Bandra Slaughter House to Deonar and construct an up-to-date slaughter house there was under active consideration.

Times of India 10-7-52.

* * *

Cattle Insurance.—According to the Evening News of India, Bombay, Cattle insurance has become an accomplished fact in this country. A newly-started insurance company from Rajasthan has started underwriting the risk for cattle and other livestock, including camels. The risk is accepted only on the basis of veterinary evidence about the animal's health.

A beginning has been made by bringing cattle in standard dairies within the scope of the insurance facilities. The company is now negotiating for business from the Aarey colony.

For the purpose of premium rates a distinction has been made between bullocks used for cultivation and for commercial purposes, the charge being higher in the case of the latter. Females in calf and heat are not, however, covered. Short-term policies covering the risk of transportation, fire and castration are also issued.

* * *

Export of Animals to Formosa.—We learn from the Times of India that a consignment of four bulls and eight cows of the famous Kankrej breed has been exported to Formosa after a lapse of nearly 20 years. The animals were acquired from the Charrady Farm near Anand. We also understand that the first contingent of this breed of cattle was sent to Formosa two decades ago.

* * *

Racing in Bombay.—Mr. Morarji Desai, Chief Minister, said in the Bombay Assembly to-day that the State Government did not intend to discontinue horse racing while answering a question by Mr. Lallubhai M. Patel. He explained that the Government had reconsidered the question and decided that for horse breeding and due to financial stringency racing should continue subject to controls. He added the question would be reconsidered if controls became ineffective.

The Chief Minister said the Government's income from horse racing had decreased gradually from 1948 to 1951. In 1948-1949 the income was Rs. 1,65,60,000. In 1949-50 it was Rs. 1,58,76,000 and in 1950-51 Rs. 1,14,42,000.

Mr. Naushir Bharucha asked whether the decision was final and whether the Government had taken into consideration all questions including the moral aspect.

Mr. Desai replied that moral considerations would be against racing. The decision applied only for the time being.

Mr. Desai said that the licence of the Royal Western India Turf Club was renewed on July 1 for one year on the following terms ;

1. The annual fee payable to the Government by the Club shall be Rs. 15 lakhs instead of Rs. 13 lakhs ;

2. The Government will have the right to audit the Club accounts at any time ;

3. The Government will nominate one member on the Committee of the Club ; the nominee may be a member or not.

4. The Club will end the system of bookies ;

5. The Club will reserve not less than 50 per cent of the total stakes in Bombay and Poona exclusively for Indian-bred horses ;

6. The Club is permitted to work totalisators on the following conditions :

(*a*) Totalisators shall not be worked at more than two enclosures in addition to the members' enclosure ;

(*b*) An unit of stake shall not be less than Rs. 5 and more than Rs. 10 provided in the members' and the first enclosure tickets for amounts which are multiples of Rs. 10 but not exceeding Rs. 500 are sold. In the second enclosure tickets for amounts which are multiples of Rs. 5 but not exceeding Rs. 50 may be sold ; and

(*c*) Such other conditions as may be framed by the Club with the approval of the Government provided the Government may at any time during the period of the licence add to, amend or rescind any of the conditions after consultation with the Club.

National Standard Racing 24-7-52.

* * *

Fodder Scarcity in Mysore.—The Government of Mysore have decided to encourage the temporary mass migration of non-essential cattle (not needed at the moment in the village) from drought-stricken Kolar, Chitaldrug and Tumkur Districts to the rich and extensive forest pastures in Malnad, in the northern parts of the State, according to a Government Press note issued to-day. This is intended to render immediate relief to the "starving cattle" in the distress areas where the fodder problem has assumed "alarming proportions".

The Press note states that the problem now is to make Malnad fodder available to the famished maidan cattle. There are two ways of doing it. The first is to transport fodder to the cattle. This, however, is beset with a number of practical difficulties involving the harvest of grass, its transport, storage and distribution. For these reasons the second alternative, namely, to move the cattle temporarily to the grazing forests is preferable.

It is of course realised that all cattle cannot be moved *en masse* from their homes to these temporary pastures. It is, therefore, suggested that the cattle needing fodder facilities be classed into two broad categories. The first category will consist of what may be called as essential cattle—those which are used by the villager for his farming needs. These have perforce to be kept on the spot. The second category will consist of those which may be termed non-essential in the sense that they are not needed at the moment in the village. These can, with advantage, be temporarily moved on to the Malnad forests.

Having in view the geography of the State, the non-essential cattle from Chitaldrug District can migrate to the Joldhal forests while non-essential cattle from Kolar and Tumkur Districts can be moved on to Tarikere in Bhadravati division from where they will be allocated and distributed amongst the several forest areas where grazing facilities are available. By this method, it would be possible to render immediate relief to the starving cattle in our distress areas. The Forest Department would give every facility for the reception and allocation of such cattle at the two receiving centres, namely, Joldhal and Tarikere.

The Government appeal to the public to co-operate in this respect and secure the maximum benefit to their cattle without endangering forest wealth.

The Hindu, 21-8-52.

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PERSONAL

Sri G. A. Shivnani G.B.V.C., Research Assistant at the Indian Veterinary Research Institute, Mukteswer-Kumaon (U.P.) in the Department of Parasitology, is going to U.S.A. on Lederle Laboratories Award, for higher studies and research work on Veterinary Parasitolcgy. He will work on cattle parasites for his Ph D. degree at the Kansas State College, Manhattan. U.S.A. He has had the unique opportunity of assisting the late Dr. Philip A Hawkins, Professor of Parasitology, Michigan State College, in his researches on Piroplasmosis during the latter's stay at the I.V.R.I., Mukteswar under the Fullbright award.

Sri M. K. Srinivasan, G.M.V.C., Veterinary officer of the Indian Veterinary Research Institute, Mukteswar, has been appointed to the newly created post of Livestock Development Officer, Andamans. He will be joining his new appointment early in September 1952.

Sri C. Seetharaman, of the Indian Veterinary Research Institute Mukteswar, has obtained his M.Sc. Degree from the Madras University, his thesis being on Rinderpest.

* * *

Poor Boys' Fund of the Veterinary College, Jabalpore.—An appeal for this fund has been sent to us by Sri H. N. Chelva Ayyangar, Principal of that College, for publication and we commend it to the readers of the Journal.

A fund named " Poor Boys' Fund " was initiated during 1951-52 for the Veterinary College, Jabalpur and the Hon'ble Minister for Finance was pleased to donate a sum of Rs. 300/- out of his discretionary grant towards the initiation of this fund. This amount of Rs. 300/- was granted to be treated as a nucleus and to be augmented with the help of donations and subscriptions from others. During the year 1951-52, it was possible to add to this nucleus a sum of Rs. 15/4/- only received as subscription from some of the stipendiary students of this College; thus the total of the Poor Boys' Fund stood at Rs. 315/4/- by the end of the year. Though this grant of Rs. 300/- was received by about the middle of Sept., 1951, it could not be operated upon as the rules governing the utilization of this fund were received about the middle of November, 1951. Even if it was operated upon last year, the entire sum would have been spent away during the year even if a single poor student had been awarded the financial help, say, at the rate of Rs. 25/- p.m. and there would have been nothing left behind for this or future years' operations. If this nucleus has

to be built up into a solid and an everlasting fund, it could be done so only with the help of liberal donations and subscriptions from noble men, philanthropist, charitable institutions, officers, students and the staff.

It is with this object in view, Sir, that I appeal to you kindly to bestow your sympathetic consideration towards this noble cause, donate or subscribe liberally and thus help me to build up an everlasting fund which may be made use of to help such poor and deserving students who are really very keen to study Veterinary Science but who are unable to take to it for want of pecuniary help.

Your donations or subscriptions may kindly be sent to the Principal, Veterinary College, Jabalpur, who will acknowledge the same with thanks. The contribution may please be sent to reach the Principal before the end of this month so that the deserving applicants may be helped from the beginning of the next academic session (July, 1952).

* * *

STANDARDISATION OF VETERINARY DRUGS

The Government of India have appointed a committee of experts to survey the present position in India regarding the production and use of veterinary biological products and to make recommendations on their standardisation.

The production, standardisation and testing quality of drugs for human use are governed by the Drugs Act, 1940. Veterinary biological products are, however, excluded from the scope of this Act and are not subject to any licensing or standardisation.

The Committee will consist of Dr. S. Datta, Director, Indian Veterinary Research Institute, as Chairman and the following members: Messrs. O. A. Bauman (Point Four expert at the Indian Veterinary Research Institute); Balwant Singh, Head of the Division of Biological Products, Indian Veterinary Research Institute; M. L. Ahuja, Director, Central Research Institute, Kasauli, P. M. Nabar, Drugs Controller, (India); Govind Rao, O.C., B.P. Section, Badhshah Bagh, Lucknow, U.P.; S. M. Sapre, Superintendent, B. P. Section, Bombay; P. M. N. Naidu, Director, Animal Husbandry Department, Mysore; N. K. Bhojwani, Deputy Secretary, Ministry of Food and Agriculture (Agriculture), *ex-officio* member and M. R. Dhanda, Head of the Division of Pathology and Bacteriology, Indian Veterinary Research Institute, Mukteswar.

The Committee's terms of reference are: (1) to survey the nature and range of veterinary biological products manufactured in and imported into India and the methods employed in their manufacture; (2) to recom,

mend minimum standards of the techniques of preparation including the packing of products; (3) to recommend standards of quality of the products; (4) to recommend tests for the safety, purity potency and keeping quality of the products; (5) to examine the necessity of licensing production so as to ensure *inter alia* centralisation of the production of specified biologicals in different laboratories and an economic division of functions among the different producing units; (6) to examine the need for special legislation for controlling production and quality and imports and exports of veterinary biologicals and the practicability of including veterinary biological products within the scope of the Drugs Act 1940, for attaining the objects in view; (7) to examine the necessity and recommend the constitution of an All-India Veterinary Board or a standing committee on veterinary biological products for implementing the recommendations made; and (8) to examine the need for the establishment of a central control laboratory and to determine its functions.

The Committee is to submit its reports to the Government of India within six months.

The Hindu, 27th August 1952.

Clinical Articles

PERINEOTOMY FOR THE SURGICAL REMOVAL OF VENEREAL GRANULOMA OF BITCHES

By

G. B. Singh., B.A., M.R.C.V.S.,

Director of Animal Husbandry & Veterinary Services, Orissa.

Introductory:—The occurrence of these tumours is world-wide but it is more prevalent in the countries where the majority of the canine population is uncontrolled. India falls within the purview of these countries, where large numbers of canine population roam about in an uncontrolled manner.

Hobday terms it as ulcerating contagious venereal tumour which is of frequent occurrence and is communicable from male to female and vice versa. Dollar describes it as Venereal Sarcomata.

Both Hobday and Dollar recommend the extirpation of the growth from the exterior with the help of a scalpel or scissors and use of artery forceps followed by sharp curette to destroy the remains of the removed

tumour. Hobday further states that the growth near the vulva can be excised as above but the growths involving the posterior vagina, cervix etc., are in-operable. Dollar also repeats the same procedure. Allam in canine surgery makes a reference to the opening of vagina for the removal of the tumour and also for eversion of vagina.

My experience, however, shows that a large percentage of the cases that are brought for treatment have advanced to such an extent that each and every case involves posterior vagina and, in the majority of the cases, the cervix as well, and that any excision from outside will not be helpful. This is specially so when the disease will definitely recur if any portion of the tumour is not completely extirpated with a portion of the healthy mucous lining of the organs involved.

Since the year 1943, I have seen a large number of cases both in dogs and bitches. Originally, having neither the required experience nor the facility to do proper surgical work, I followed the technique advocated by both Hobday and Dollar and failed in each and every case with the exception of two males in which I could completely excise the tumour with the adherent mucosa of the penis by retracting the sheath back to its full length.

In this connexion, I would like to point out that extirpation in the case of male is much easier specially when the tumours are not very large than in the females due to the fact that the sheath can be retracted even though with some difficulty after general anaesthesia, but there is no instrument yet known which will evert the vagina. I feel that the use of the speculum will, as a matter of fact, hinder the operation than help it. Besides, the tumour is very fragile and apt to bleed and in some cases so large that it will not be possible to use any speculum. After having failed in every case operated in the females in the year 1950, we started operating by completely opening the vagina on its superior aspect. Up till now, 8 cases in bitches have been operated with only one fatality. This fatality was in the first case handled in which we used Intraval Sodium as a general anaesthetic. I personally feel that the animal died of shock.

The symptoms of this disease are so well known that it is superfluous to narrate them. Preparation of the patient, site and anaesthesia are given below in detail. The technique of operation also is given in detail in the hope that this will stimulate interest in brother veterinarians and that a perfect technique could be evolved for this disease which is much prevalent in this country.

Preparation of the patient:—Animals are kept fasting for 24 hours prior to operation and are given a saline purgative and high enema to avoid possible contamination of the site during operation by involuntary defecation.

Preparation of the site:—The vulva and the adjacent part from the anus to the hips on both the sides are shaved and thoroughly washed with soap and water, swabbed with spirit and then bandaged with a sterile pad soaked in acriflavin-in-spirit for 12 hours prior to operation.

Anaesthesia:—Except in the one case which died of surgical shock, we have used Nembutal as general anaesthesia. In that first case, Intraval Sodium, which is a short acting barbiturate, was used. The animal recovered immediately after the operation and could not tolerate the pain of surgical interference and died within 4 hours of operation. For the rest of 7 cases, Nembutal was used. This anaesthetic, due to its long duration, helped to a very great extent to overcome surgical shock.

Technique of operation:—Prior to induction of anaesthesia, the bladder is emptied and then immediately after induction of anaesthesia, the animal is draped with sterile sheets keeping a window at the site of the operation. The site is again protected with 4 sterile towels and clamped with towel clips. The site is again scrubbed with Tincture Metaphane. The anus is covered with a sterile towel and clamped with towel clips to avoid any possible contamination during the operation. A longitudinal incision is made from about an inch and half below the anus dividing the roof of vagina in two equal parts and splitting the lips of vulva, thus exposing the entire vaginal canal. Small portions of the tumour are then clamped along with a small amount of the healthy tissue of the vaginal lining by means of curved artery forceps and the tumour excised from above. Catgut ligature is applied below each forceps and tied. At times there may be bleeding but by using the above method, it can be controlled. After the entire tumour is removed, the cavity is dusted with sterile sulfanilamide powder. The incision is closed in two layers, the inner lining with Catgut and the skin with Nylon, both interrupted sutures. A pad soaked in acriflavin-in-spirit is kept in position with a square bandage leaving one tube each for passage of urine and faeces.

After-care:—Immediately after the operation, a 5% solution of Glucose 100 c.c. is injected intravenously and 2 pints of normal saline solution subcutaneously at body temperature. Then skin sutures are removed on the 7th or 8th day by which time there is complete healing of the wound. So far in all the 7 cases, we have not seen any recurrences nor any narrowing of the vaginal canal due to cicatricial tissue.

My grateful thanks are due to Sri M. M. Rao, G.B.V.C., Veterinary Assistant Surgeon, Cuttack, for his help as an anaethetist and assistant in the operation, for the after-care and for keeping the records of the cases.

In the following table, 8 case reports are given :—

DETAILS OF CASES OPERATED

Sl. No. 1	Breed. 2	Weight of animal. 3	Anaesthetics used. 4	Quantity of anaesthetics consumed. 5	Duration of anaesthesia. 6	Rate of complete recovery. 7	Disease. 8	Date of operation. 9	Date of removal of sutures. 10	Result. 11	Remarks. 12
1.	Spaniel	21 pounds.	Intraval Sodium.	4 grains.	20 minutes.	...	Venereal Granuloma.	10-2-50	...	Died.	Case No. 1. died 4 hours after the operation due to surgical shock—probably due to the use of a short-acting barbiturate.
2.	do	32 pounds.	Nembutal.	5½ grains.	2 hours.	18 hours.	do.	15-1-51	21-1-51	Cured.	
3.	Terrier	16 pounds.	do.	2¾ grains.	1 hr. 50 minutes.	16 hours.	do.	15-2-51	22-2-51	Cured.	
4.	Spaniel	16 pounds.	do.	2¾ grains.	2 hours.	18 hours.	do.	10-3-51	17-3-51	Cured.	
5.	Cross-breed	28 pounds.	do.	4¼ grains.	1 hr. 40 mts.	20 hours.	do.	4-4-51	11-4-51	Cured.	
6.	do.	20 pounds.	do.	4 grains.	2 hrs. 55 minutes.	38 hours.	do.	6-11-51	14-11-51	Cured.	
7.	Grey Alsatian	45 pounds.	do.	7 grains.	2 hrs. 20 minutes.	18 hours.	do.	18-11-51	25-11-51	Cured.	
8.	Cross-breed	37 pounds.	do.	6 grains.	2 hrs. 40 minutes.	27 hours.	do.	2-1-52	10-1-52	Cured.	

ACETONEMIA OR KETOSIS IN BOVINES

By

S. B. GHALIGI, G.B.V.C.,

Hospital Surgeon, Bombay Veterinary College.

According to Udall[1], 'Ketosis is defined by MacKay "as the occurrence of accumulation in the blood in significant amounts of the so-called acetone bodies, namely beta-hydroxybutyric acid, aceto-acetic (or di-acetic) acid and, secondarily, acetone. In normal subjects on a general diet ketone bodies are present in the blood in considerable amounts. An excess of ketone bodies in the blood is due to carbohydrate lack".'

According to Hutyra and Marek[2], the disease occurs during lactation and is associated with disturbance of carbohydrate metabolism and formation of excessive quantities of acetone bodies and cholestrin. These metabolic changes are followed by digestive and nervous disturbances. It usually affects heavy milkers and occurs with stall feeding after 3—6 calving. It develops 2—4 weeks (rarely one week) after normal calving.

During the last one year, I had occasion to treat cases of Acetonemia in cattle in the Out-Patient Department of Bai Sakarbai Dinshaw Petit Hospital for animals and the object of this article is to record a few of these cases which, as far as I am aware, are not very commonly met with in this country.

It was in the afternoon of 2-3-51 that a well nourished Gir cow was brought to the Hospital with the history of having normally calved about two weeks back and of having been off-feed since 3—4 days. The cow had been given a heavy feed of wheat, ghee etc. after calving (as is the practice amongst many owners in these parts).

Symptoms :—Animal rather dull, respiration normal, temperature. 102·4°F, bowels irregular, rumination suspended, slight salivation and decrease in milk yield.

Treatment :—Diagnosing it as a case of 'dyspepsia' consequent on overfeeding after calving, an opening dose was given and a few packets of Tonic powder were supplied. Mouth was cleaned well and gargled with alum lotion.

The tonic powders were continued till 7-3-'51 and the animal showed slight improvement. On this day the owner reported that the animal had started behaving a bit violently and had fainted twice that evening.

On examination, the cow showed the following symptoms: Temperature 102°F, off-feed, rumination suspended, bowels loose, eyes cynotic and anxious look. A characteristic smell resembling Chloroform

emanated from the animal which was highly suggestive of Acetonemia. It being very late in the evening, a sedative dose of Chloral-Hydras with Sodii Bicarb was administered. A sample of urine was collected and sent to the Physiology Laboratory of the Bombay Veterinary College: it revealed presence of Acetone bodies. On 8-3-'51, 300 c.c. of 20% Calcium-Borogluconate was injected intravenously and an alkaline mixture was given by the mouth.

Due to some untoward happenings at the owner's place, the cow was not given any treatment till 22-3-'51. By that time, the symptoms had aggravated. The animal was lying prostrate, much emaciated, bowels loose, temperature 101°F., marked decrease in milk yield and the whole shed was giving out smell of chloroform—characteristic of Acetonemia. The cow was injected with 500 c.c. of 25 per cent Glucose and 300 c.c. of 20 per cent Calcium-Borogluconate intravenously. Alkaline mixtures by mouth were continued. Concentrates in food were withheld and jaggery to the extent of two pounds per day was advised to be given in feed. Next day i.e. 23-3-51 the same treatment was repeated. The animal showed improvement; was able to stand up and looked rather lively. Further injections of Glucose and Calcium-Borogluconate were given on 25th and 27th March'51 and the sample of urine was again sent for analysis. Meanwhile the cow showed great improvement. The smell from the mouth had decreased, appetite improved, milk yield increased and the cow could move about freely in the compound. The analysis of urine on 28-3-1951 still showed the presence of acetone bodies. Therefore a massive dose of 1000 c.c. of 25 percent Glucose and 300 c.c. of 20 percent Calcium-Borogluconate were given intravenously. Alkaline mixture was also continued. From this day onwards, the cow showed further improvement; appetite became normal, milk yield increased and the smell from the mouth disappeared.

(2) The second case also was a cow with similar history and symptoms and it was brought to the Hospital on 22-3-1951. This was her second calving and the symptoms had set in during the second week after calving. From the characterstic smell emanating from the animal, it was diagnosed as a case of Acetonemia and on the very day I gave 500 c.c. of 25 percent Glucose and 250 c.c. of 20 percent Calcium-Borogluconate intravenously. This cow recovered with this single injection. In this case the urine could not be got analysed.

Both these cows were last seen by me in January' 52 when I found them both in the best of health and in calf again.

(3) The third case was a she-buffalo with the same history and symptoms and brought to the Hospital on 17-1-1952. On diagnosing it to be a case of Acetonemia and on finding acetone in the

urine 1 injected 200 c.c. of 25 percent Calcium-Borogluconate (M & B) intravenously; on analysis of urine acetone bodies were detected. 1000 c.c. of 25 percent Glucose and 300 c.c. of 25 percent Calcium-Bororglu-conate (M & B) were injected intravenously on 20-1-1952. The buffalo responded to the treatment. Two days after the second injection, the urine was negative for acetone.

A fourth case of acetonemia in a cow during March 1952, was also given the same line of treatment. Two injections of the Calcium Borogluconate and glucose solutions were given each of 200 c.c. and 500 c.c. respectively at a time. Analysis of urine of this cow both before and after the treatment was confirmative.

In addition to the cases described above, I had an occasion to see a a case of nervous type of Acetonemia in a cow with symptoms of high temperature (104.F.), off-feed, marked excitement and wild look, reckless movements, champing of jaws, severe licking of skin, profuse salivation and marked drop in milk yield. The smell from mouth was typical of Acetonemia and the history supported the diagnosis. However, to eliminate it from Acute Bovine Trypansomiasis, blood smears were sent to the Bacteriologcial Laboratory of the Bombay Veterinary College and they were negative. This cow died before I could give any treatment or have the urine analysed.

Conclusion:—The disease is seen in heavy stall-fed milch cattle. The practice of overfeeding the animal with rich concentrates after calving is a predisposing cause. Though there is certain percentage of acetone bodies normally in the blood and urine of animals after calving, the sweet smell from the mouth resembling chloroform indicates the excess of it and is diagnostic. If immediate treatment is given with Glucose and Calcium the animal recovers rapidly. Delay in the recovery of the first case was apparently due to the case being in an advanced stage of the disease brought about by the carelessness of the owner.

My thanks are due to Shri. Shingatgiri, Lecturer, Bombay Veterinary College, for examining samples of urine from time to time and to Dr. S. R. Chadha, B.Sc. M.R.C.V.S., Principal, Bombay Veterinary College, for his encouragement and guidance in writing this article.

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A CASE OF CONGENITAL GOITRE IN KIDS

By

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History:—An ordinary *desi* goat of medium size, brown colour, aged, gave birth on 12th Oct. 1951 to 3 dead kids, all hairless and having enlarged goitre. (Figs. I and II). This goat had been living in the office compound for the last 3 years. Two of the 3 kids weighed 4 lbs. while the third one weighed 4 lbs. 4 oz., the normal weight of a kid when born single being about 6 to 6½ lbs. In her last pregnancy she gave normal twins.

Fig. I

Fig. II

Histopathology:—Thyroid gland:—Individual acini were enlarged, lining epithelial cells showing irregularity in size. Because of the hyper-plastic changes the epithelium was thrown into folds which at places were filling the lumina of the acini. An occasional desquamation of the epithelial cells could be detected. There was very little of feebly stained colloid in the glandular acini. A few of the acini showed flattened epithelium due to the pressure from the increased quantity of the colloid.

Thymus:—The stroma was well developed. Lobules were not distinctly defined into cortex and medulla. Hassell's corpuscles were not well defined.

Pituitary:—Acidophilic cells (alpha cells) were fewer in number and there was increase in the number of basophilic cells (beta cells).

Testis:—The stroma was well developed. The seminiferous tubules had not reached maturity.

Discussion

The clinical evidences of iodine deficiency in farm animals have been clearly described by Welch[5] (1917, 1928 and 1940) and others. Gross iodine deficiency usually results in the birth of weak or dead foals; dead, weak, "big necked", sometime hairless calves; dead, weak and often partially wooled lambs and in pigs the new borns are frequently hairless or nearly so, the skin is thickened and edematous and the pigs often seem fat and flabby.

Mills[2] (1934) reports similar symptoms and, in addition, mentions that the cows in deficient areas frequently retained the membrane and developed metritis with high mortality. Apparently the deficiency occurs in goats as well, but no specific mention of this condition has been made in the few publications which were easily accessible. For this reason, this case is being recorded. Generally iodine deficiency symptoms are associated with certain tracts, where the soil is known to be deficient in iodine such as Great Plains, Rocky Mountain, Pacific Coast and Great Lakes in U.S.A. and many hilly districts of India; but Meerut district has never been known to be iodine deficient. Also the information from goat farms existing for the last 15 to 20 years in districts like Hissar and Etah do not show any evidence of this syndrome occuring there. Minett[3] (1950) who has made a detailed study of sheep and goat diseases on various farms in India does not mention this condition. In the hill areas like Chakrata in Dehra Dun, goitre is common among human beings but surprisingly does not occur in livestock. This observation is confirmed by various workers in other countries as well.

Iodine is specially required in pregnant animals, though Morrison[4] (1939) writes 'that there is no need of supplying additional iodine to pregnant animals in areas, where there has been no trouble from goitre in new-born animals'. Apparently in this goat, the requirements of iodine were more than were available in the body as triplets were being carried, and the total iodine available was to be used for 3 young ones, instead of one or two.

Incidence of triplets is about 6.3%, twins 57.4% and single 35.7%. Keeping in view these percentages, the birth of triplets cannot be considered strictly normal. This also shows that iodine present in the animal was just on the border lines and slight increase in the demand resulted in this abnormality.

Since thyroid function is closely interlinked with other endocrine glands, the histopathology of other endocrine glands was also studied. The thyroid showed the typical lesions expected in goitre while the changes in other glands such as the increase in number of basophilic (beta) cells in pituitary and immaturity of seminiferous tubules in the testicle show abnormalities, but their exact significance cannot be determined on an

individual case. Further study on these lines may help us to determine the exact significance of these changes in the endocrine glands in cases of congenital goitre. It may be mentioned here within parenthesis that 'administration of thyroid substance, of anterior lobe extracts and of epinephrine is said to increase the number of alpha cells while iodides are believed to reduce the number of both alpha and beta cells.'

Acknowledgments

I wish to acknowledge my thanks to Sri P. R. Krishna Iyer, Research Officer, I.V.R.I., for the histopathological examination.

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A SAFER AND MORE CONVENIENT SITE FOR INTRAVENOUS INJECTION IN CATTLE & BUFFALOES

By

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Due to the incredible soring of prices of livestock and the consequent demand on the present-day veterinarian for treatment, curative as well as preventive, there are greater opportunities for him to administer medicines by the intravenous route than were available to his comrades of a decade ago.

The conventional site for intravenous injection in large animals is the jugular vein. Whereas this is quite satisfactory for the horse and a negligible number of cattle which may allow the injection to be performed in the standing position, most cattle and almost all buffaloes will not allow this. Casting and securing them properly becomes necessary. Such a mode of restraint in diseased animals may be unsafe and even cruel. Besides, it is essential that the animals should be at ease as much as possible while the injection is being given, so that any slight discomfort the animal may suffer as a result of the injection may immediately be detected and further administration stopped if necessary.

Further, there being plenty of loose tissue in the region of the neck perivascular infiltration cannot be quickly detected. Such extravasation

may prove very harmful when highly irritant substances like Antimony tartarate, Formalin etc. are injected.

Again, where large quantities are required to be injected the recumbent position is neither comfortable for the patient nor for the operator.

It is, however, possible to surmount all these difficulties by making use of any of the veins at the back of the external ear. These veins are prominent in most cattle. The advantages of this site for intravenous injection are as under:—

(1) The injection can be made while the animal is in the standing position.

(2) Considerable less assistance and restraint is necessary and the animal can be released instantaneously if this is desired.

(3) The operator can himself observe the patient's breathing and facial expressions for any sign of distress or intolerance, while the injection is in progress, thus adding to the safety of the procedure.

(4) If the injection is made as far away from the base of the ear as possible the vein does not wobble.

(5) There is practically no loose tissue in the region and even very slight extravasation can easily be detected and the position of the needle corrected.

(6) The skin of the ear is comparatively thin and tender and a small needle can be used for injection—thus reducing the flow of the fluid into the vein. A thick needle can also be used without much difficulty.

(7) In the event of perivascular extravasation of very irritant substances like Tartar Emetic, there being no vital organ involved, little damage can result. The whole ear may, if necessary, be cut off without causing any disability to the patient, but such a drastic measure will never be required, considering items 4, 5 and 6 above.

It should be noted that the area surrounding the ear must be kept free of the restraining rope; lack of care in this connection may lead to a block in the circulation.

This site can also be used with great ease for obtaining small quantities of blood for agglutination test etc. Though the method suggested above may seem unimportant to the casual worker, its advantages should be judged by the convenience to the operator and the safety of the operation, to say nothing of the all-important fact—comfort of the patient.

Those of my friends and colleagues who have already adopted this site have unanimously reported its superiority over the normal or old site and it is hoped that this will be received similarly by other workers.

Extracts and Abstracts

The Clinical Syndrome known as "Acetonaemia".†—Dr. Scaribrick, of Cambridge University, gave a paper which aimed at summarising the bio-chemical nature of ketosis in general, and in particular factors which might be concerned in bovine ketosis; a few of the many therapeutic agents used in ketosis were then discussed against the background which had been sketched out.

The starting point was the observation of the presence of acetone in the milk and body fluids. This was traced back to aceto-acetic acid and linked to the third ketone body, B. hydroxybutyric acid. The aceto—acetic acid itself arose from active acetic acid and could be regarded as an overflow product. With the help of analogies drawn from the Inner circle of Metropolitan Railway a picture was obtained of the obscure bio-chemical reactions involved in the metabolism of the liver cell and the results of these on the metabolism of active acetate and hence of ketone bodies.

Specific factors influencing this and the cow towards the side of ketosis were (a) lactation, (b) the ruminant method of digestion, (3) the possibility of adrenal cortex inefficiency.

The therapeutic agents magnesium, cobalt, potassium, vitamin A, vitamin B, insulin and glucose were then discussed, particularly as to whether and where they fitted into the above picture. It was concluded that there was no therapeutic agent with 100 per cent. success in either theory or practice.

Dr. Holmes, of Liverpool University, read a second paper which was concerned with the disease as seen clinically in the cow. He included in the term "ketone bodies" acetone, aceto-acetic acid and B hydroxybutyric acid. He regarded the condition as really only one symptom of a very complex syndrome. Many apparently normal cows in winter excrete acetone in the urine and it is therefore preferable to use milk as an aid to diagnosis, using a mixture of solid sodium sulphate and sodium nitroprusside. This test can be carried out quite easily in the cowshed.

From his own observations it was noted, amongst other things, that:

1. The cow may excrete appreciable quantities of ketone in the milk and urine without any symptoms of metabolic disturbance being manifested.

2. Diminished food intake from whatever cause—anorexia, unpalatable food, etc.—appears liable, in high producing cows in winter, to result in the excretion of ketones in the milk and urine. It is suggested that prolonged anorexia or fasting would probably be followed by a fall in milk

† Extracted from the proceedings of the meeting of the Southern Counties Division, N. V. M. A., held at Southampton on September 15th, 1950. *Veterinary Record*, Vol. 62, No. 52.

yield which might, at least temporarily, counteract this effect. Hence cows should be fed on palatable foods, and all changes in feeding be introduced gradually.

3. Multi-parous cows calving in the winter period (October to February) appear more liable to develop subclinical ketosis than heifers although the condition does occur in first calvers. The condition appears most likely to arise during the period of maximum "metabolic stress":— immediately following parturition and whilst the milk yield is high.

4. Pasture grass in spring appears to be very beneficial in reducing the incidence.

5. Clinical data showed that the average number of days after calving to the appearance of first symptoms was 24 (16 cases), the duration of illness was 18 days (12 cases), the average blood sugar level was 32 mg. per cent. (six cases), the average plasma acetone level was 72 mg. per cent. (six cases) and the average milk yield fall 22 lb. per day (16 cases).

Bovine ketosis is characterised by hypoglycaemia and although the fundamental aetiology is unknown the following theories have been expounded.—

(1) Lack of carbohydrate.
(2) Hepatic dysfunction.
(3) Vitamin deficiency (particularly vitamin A).
(4) Endocrine dysfunction or imbalance.
(5) Alterations in rumen digeston.

Dr. Holmes had tested sufficient samples to express the opinion that acetone was not formed in the rumen in sufficient quantities to influence the ketone levels in the other body fluids. Once the animal starts to eat concentrated food the blood agar rises, serum ketones fall and the animal makes a clinical recovery. The speaker believed that the symptoms shown in bovine ketosis are those of liver dysfunction consequent upon fatty infiltration and changes in the glycogen fat ratio in the liver cells.

Among a wide variety of substances used therapeutically, Dr. Holmes had investigated the use of glucose in some detail as he believed its use was rational in view of the low B.S.L. He found the B.S.L. returned to normal following a glycosuria within about two hours after intravenous injection, and hence preferred the subcutaneous route. Molasses or other forms of sugar by mouth resulted experimentally in a negligible rise in the B.S.L. due to their rapid fermentation in the rumen. In fact they would seem to be contra-indicated as they produced transient acetonaemia due to the influx of large quantities of fatty acids from the rumen. The fact that feeding grass in the cowshed does not seem to have the same beneficial

effect as when it is grazed may be associated with breakdown of muscle glycogen during exercise.

In opening the discussion Mr. J. M. Ingram said that he recognised and had confirmed acetone in the milk under the following conditions.—

(1) The cow which was normal in every respect, feeding, and milking well, but the owner complained of the odour from the milk.

(2) In hypocalcæmia (a) ordinary, or (b) delayed type,

(3) In hypomagnesæmia.

(4) Accompanying a foreign body and usually but not always in the milking cow at that period when being stall fed.

(5) With a subacute metritis.

(6) This type was first described to him by Imrie and occurs during winter months in cows three to six weeks calved. The animal rapidly loses weight, drops in milk yield and will not eat concentrates but will eat all the hay allowed. The fæces are dark, firm in consistency with a glazed shiny coating. Formalin administered in 3 drachm doses two to three times daily, well diluted, appeared to be a perfect answer. In recent years, however, this variety is not so prevalent, or it merges more into the

(7) Type in which even the appetite for fodder is greatly diminished so that the animals will eat only a little over-heated brown tobacco-smelling hay or a mouthful of various tempting foods.

Most of these do respond to glucose therapy in 6 oz. doses intravenously every second day.

It is his custom, when all else has failed, to resort to the use of 2 to 3 drachms of formalin in up to 1 pint of water intravenously. This gives rise to a certian amount of shock with accelerated breathing and lachrymation which subside within 30 or 40 minutes. It is not 100 per cent. effective but it has saved many cases which obviously were going to die.

In the considerable general discussion which followed, Mr. Barker, Jnr. mentioned the use of acid-sodium-phosphate and of chloral hydrate, Mr. White remarked on the beneficial effects when milking was temporarily suspended. Mr. Thompson queried whether the use of sulphonamides in cases where acetonæmia was complicated by infection *e.g.* metritis, might not affect the rumenal flora. He thought that in order to prevent the break up in the rumen of glucose or molasses when administered *per os*, it might be useful to mix them wtih copper sulphate, in the hope of closing the œsophageal groove. He had seen typical symptoms of acetonæmia develop due to water lack in cows tied up when faulty water bowls blocked. Mr. Forrest had not had any reaction to subcutaneous injections of glucose

solution provided they were given at body temperature. Messrs. Hall-Patch, Pook, Foden and Smith of Christchurch also spoke.

In the reply. Dr. Holmes said that after trials with protein hydrolysate he had not found it as good as glucose and very much more expensive. He described in detail Paterson's modification of Rothera's test for acetone which could be carried out very conveniently in the cowshed. He thought the problem centred round the fatty liver and that the answer was probably to be found in some drug which would remove this excess, but had not found choline of any use. Dr. Scarisbrick queried this conception of the condition but agreed that the use of insulin was contra-indicated.

* * *

Composition of milk of Indian animals.—1 Freezing Point, Lactose, Chloride and Acidity in the milk of different breeds of animals.—By C. S. DHARMARAJAN, R. VENKATESWARA RAO, M. N. MENON and NOSHIR N. DASTUR. *Indian J. Vet. Sci. & Ani. Husb.* Vol. XX, Part 1.

Nearly 1,300 samples of cow and buffalo milk have been examined for freezing point, lactose, chloride and titrate acidity.

Over 96 per cent of cow and buffalo milk samples show freezing point depression greater than 0·530°C. The average freezing point of cow milk is—0·548°C. and of buffalo milk—0·552°C. The range of distribution of freezing point is wider in buffalo milk compared to cow milk.

Cow milk is poorer in lactose than buffalo milk. The average lactose of cow milk was 4·92 per cent. and buffalo milk 5·26 per cent. On the other hand cow milk contains greater amount of chlorine than buffalo milk, the averages being 0·089 and 0·072 per cent. respectively.

Lactose and chloride contribute nearly 77 per cent. to the freezing point depression in case of cow milk and 72 per cent. in the case of buffalo milk.

The average acidity of cow and buffalo milk was 0·12 per cent. lactic acid.

* * *

Mortality in Sheep and Goats in India.—By F. C. MINETT. *Indian J. Vet. Sci. & Ani. Husb.* Vol. XX, Part, 11.

This is an analysis of deaths among animals on certain Government sheep and goat breeding farms mentioned below. Some of these are now closed. Two sets of data have been used, (*a*) a sample or series of at least 100 fatal cases which at the author's request the farm managers have been good enough to provide, and (*b*) the reports submitted annually by most of the farms to the Indian Council of Agricultural Research.

Banihal.—Banihal in Kashmir lies between Jammu and Srinagar at 5,200 fit. The sheep farm is on a mountain slope, with abundant facilities nearby for grazing and growing hay and other fodder. Routine management is as follows. During the summer the flocks move up a few miles to forest grazing areas at 6,000 ft. to 12,000 ft. About November, while the 'stationary' part of the flock remains at Banihal, the migratory part moves down to winter forest at Reasi (Jammu), at 2,000 ft., to 3,000 ft. The journey of 80 miles across the hills takes about a fortnight, but the rams are moved by lorry in the day. At Reasi, there are also good grazing and watering facilities.

There in November and December the ewes are mated and are moved again to Banihal in April where it is stated they lamb in April to June. Mating of those staying at Banihal is rather earlier.

The object of the farm is to test the grading-up of local ewes with imported rams Merino, Cheviot, Border Leicester and Wenseleydale. The migratory flock remains in the open throughout the year, but lambing ewes are penned if the nights are rainy or cold. The stationary flock is housed from mid-November to mid-April and fed on hay. Rainfall in winter at Reasi is heavy, the normal average for the month being 4·23 in. from January to March. There are some 400 ewes. The mean annual birth-rate from 1942-46 was 237 ; during March 1943, 168 lambs were born. Rams and pure-bred stock are given concentrates ; breeding ewes and half-breds subsist on grazing. Shearing of the local stock is thrice a year, in March, July and October, and they are dipped after the October clip. There was a good deal of trouble from fluke disease, sheep scab and in lambs from some helminthiasis. There were also heavy losses in lambs from pneumonia, caused by winter rains.

Peshawar.—The farm was actually at Togh (Kohat) at 2,500 ft. The object of the scheme was to explore the possibilities of Karakul pelt production by crossing pure Karakul rams with Hashtnagri ewes. The mean population in 1943-45 was 110 ewes and 50 young stock. Most of the lambs were born in January and February.

Setbacks due to disease have been from sheep-pox in 1943-45, rinderpest in 1942, pneumonia, foot and mouth disease, and especially in 1945 what was diagnosed as pasteurellosis. There has also been lack of a good water supply.

Since young stock are liable to be slaughtered soon after birth for pelt production or when about three months old, consideration of mortality rates is of little value in this flock.

Quetta.—The Bibrik breed of sheep was kept here. In summer the flock was grazed at Nigandi (9,000 ft. to 11,000 ft.), 17 miles north east of Quetta, on wild hilly country intersected by ravines. In the lower tracts of these hills the weather is hot in summer and the rainfall precarious, so that the flocks had to move. An account of the conditions at and near Nigandi and of the Bibrik breed is given in the first report (1941-43). Normally,

lambing was from end-March to mid-July, and early lambs did better than late ones. In September or October the flock moved down to a place near Sibi, a journey of 120 miles across the mountains, which occupied about two weeks. The grazing area near Sibi was subject to flooding in July-August and at the end of winter. In March the stock moved up again. Shearing was at end of May and beginning of November. Usually, rams alone were fed on concentrates. the ewes subsisting on grazing. The scheme had many adversities due, in part, to climate and disease factors. In 1943 and 1945, the summer rains failed and this meant lack of green grazing, so that both young and old suffered. At Sibi there were sometimes cold winter rains. The farm site at Nigandi had a northerly aspect, unfavourable to the early lambing desired in Baluchistan owing to the short period available there for green grazing. Every year from April to July there were outbreaks of a fatal disease, of obscure origin though well known in the area. An account of this disease is given in the 1943-44 report. To avoid this, the practice was to move the stock to other areas, but this inadvertently proved fruitless ; moreover, interfered with grazing and led to excessive mortality especially in ram lambs. There was also lack of shelter, for animals and attendants. The young stock have suffered from pneumonia and from lousiness and the adults from myiasis, while in 1943 there was a severe outbreak of foot and mouth disease.

Hissar.—Bikaneri sheep have been bred at the Punjab Government farm since 1928 and the object of the scheme (under the supervision of Mr. P. N. Nanda) has been to study methods of breed improvement, and to gain some detailed information of feeding and pasturage, breeding and general management. The flocks are accommodated in thorn pens, with some shelter. The best mating season was found to be March to May, to produce lambs at the close of the monsoon, when ewes have plenty of milk. The rams get some concentrate feeding, but the ewes ordinarily subsist on grazing—on irrigated stubbles or fallow, or on *barani* land. Experiments were conducted on grazing under these different conditions. Shearing is done in early April and October, while dipping is unnecessary in places like Hissar where the climate is hot and dry and skin parasitism is unimportant.

Progress of the scheme has been very much at the mercy of the weather. The normal rainfall is 17.67 in., but failures leading to famine conditions have been common. Thus, the summer rains failed in four successive seasons, 1938-41, and were scanty in 1943. In 1944 they were normal in amount and distribution. The winter rains failed in three successive seasons, 1941-44. In 1945, the summer rains were in excess and this interfered with grazing. Also in 1942, the heavy rains coincided with lambing, and not only was grazing stopped for days together but there was also much myiasis. The result was loss of milk, especially with young ewes, and mortality in the lambs or prolonged growth setback in the survivors.

As regards disease, there has been some mortality in lambs from pneumonia and trouble from an obscure disease labelled 'encephalo-myelitis', affecting sheep below three years of age. Foot and mouth disease was severe in the breeding seasons of 1944-45. Some ewes aborted every year. There was little parasitism.

As regards the goat flock at Hissar, the object is to establish a pure Neetal flock. In some years there has been moderate trouble from disease. Thus, there has been goat-pox in 1945-46,mastitis—sometimes gangrenous in type—and some tuberculosis, which was controlled by tuberculin-testing and segregation of reactors. There was also at times a high mortality in young kids from various causes.

Monghyr.—It is situated near Gaya (Bihar). For the first few months the flock was stationed at Gaya, but was moved to Monghyr in November 1942. The intention is to breed a white sheep with superior wool. The farm is at the foot of a hill on an area of just over 200 acres, though only 80 to 90 acres are available for the sheep. As this land is bare from January to June, some concentrates have to be fed during these months. Watering is from a well. There is probably insufficient protection from rain and wind. From 1942-46 the ewes were allowed to lamb at almost any time of the year. At Gaya and in the early days at Monghyr there was much trouble from helminths—haemonchus and paramphistomes; since then helminthic disease has been uncommon. Most of the deaths in ewes and young lambs are ascribed to malnutrition of the ewes. Lambs born in July to September have more resistance. There have also been some cases of blackquarter.

Bhamburda.—It is situated on forest land to the west of Poona at 1,800 ft. The farm has 280 acres of grazing on the eastern slopes of a chain of hills running north and south, which give protection from the south west monsoon. The object is to improve the wool of Deccan breed, partly by crossing with Merinos. A full account of the local conditions is given in the 1938-39 report, and helpful remarks on sheep husbandry and the wool problem in this and other reports. The normal rainfall is about 36 in., the monsoon with its South-West winds lasting from mid-June to September, the latter being the rainiest month. The winter season is from mid-November to end-January; the weather then is dry and cold with easterly winds. April is the hottest month. In 1940, the rainfall was normal, but the rain continued till January, creating bad conditions for sheep. Most of the Deccan sheep are in fact found in the more arid districts towards the east where the rainfall is 15 in. to 25 in. In 1942, the rainfall was badly distributed causing feed difficulties in the following year. Lambs born in August and September get a better start than those born earlier on later. Shearing is end-August, and January or better mid-February. There has been same trouble from worms during the wetter years, e.g. 1938-39.

Hosur.—The sheep are kept at the Livestock Research Station, situated in the north-west corner of Salem District (Madras), at about 3000 ft. There

has been a flock at Hosur since 1924. One of the objects is to evolve a white breed; for this purpose selected Bellary sheep have long been inter-bred, but since 1938 they have also been crossed with Bikaneri rams from Hissar. The total farm area is 1650 acres, so there should be plenty of scope for grazing. The rams are fed concentrates throughout the year; ewes at particular periods, as judged necessary. Neglected rams are bottle-fed with cow's milk. Shearing is in spring and autmn, usually March and September, followed by dipping afer two to six weeks. The climate is described as dry and mild, with maximum and minimum temperatures of 90° F. and 60° F., March and April being the warmest and December and January the coldest months. The programme has been checked by helminthic infestation (*Haemonchus* and *Oesophagostomum*), while an important cause of death, at least from 1941 onwards, has been enteritis due to immature amphistomes, the effect of which has been mainly evident in winter.

Etah (*Uttar Pradesh*).—It is situated at about 300 ft. Originally, two breeds of goats were being selectively bred, Jammapari and Barbari, but from 1941 the latter breed only was kept. A great deal of valuable information has been accumulated at the station under the direction of Mr. A. E. Slater on various aspects of goat breeding and dairying. There has been much trouble from disease, such as pneumonia, foot and mouth disease, goat-pox, and in the winter months *bisi* (probably paramphistomiasis).

Orai.—It is in District Jalaun (Uttar Pradesh) about mid-way between Kanpore and Jhansi at 770 ft. The farm of about 230 acres was started in November 1938 and in the spring of 1939 Bikaneri and local (Jalauni) sheep, about 100 of each breed, were introduced. The work made a bad start due to an extensive outbreak of sheep-pox during the summer of 1939 and the following winter. Since then, sheep-pox has appeared on more than one occasion, in spite of ovination. Shearing is during first halves of April and October.

Dhar.—It is in District Betul (Madhya Pradesh), at 1,260 ft. There was much disease in lambs, presumably helminthiasis, in 1945-46. Shearing is in April and October.

Shillong.—The Government Experimental Farm is at 6000 ft. and has a rainfall of about 100 in. a year. Among others, Bikaneri and Hissardale sheep are kept.

Hingoli (*Hyderabad, Deccan*).—It is at 1500 ft. Shearing is in March and October.

Farms in Mysore State.—Hunsur. Sheep breeding is practised at the Cattle breeding station, altitude about 2500 ft. This small flock is shorn in February.

Hebbal (Bangalore District). Altitude about 2500 ft. The flock number some 30 only and shearing is in February.

Garudapalaya (Kolar District). Altitude about 2500 ft. Shearing of the some 250 sheep is in February.

Yellichihalli. It is 12 miles from Mysore City at about 2600 ft. Shearing is in January. There are 420 acres of rather poor land. Annual rainfall in 1940–44 averaged about 34½ in.

An analysis is made of deaths among sheep and goats on the above-mentioned farms. The analysis is based on (a) particulars of 100 to 300 or more fatal cases occuring on each farm over a period usually of at least three years-spoken of as 'direct sample data', (b) data extracted from reports submitted annually to the Indian Council of Agricultural Research.

The total number of deaths in sheep analysed under (a) is 3548 and in goats 540, and the data are tabulated. Deaths are dealt with under five groupings (1) disorders of early life, (2) parasitic disorders, (3) lung affections, (4) old age, (5) miscellaneous cases, and they have been further considered according to age at death and the season of its occurrence. Within these groupings, allocations are somewhat arbitrary. For instance, group 1 includes deaths up to six months of age, group 2 includes deaths ascribed to 'debility', 'diarrhœa' etc., if parasitic disease in the flock was known to be widespread; group 3 excludes cases under six months of age; group 4 is confined to animals of six years or over, provided there was no easily apparent cause such as pneumonia; group 5 includes sheep-pox deaths, from wild animal attack and so on.

Both direct sample data and data from the reports emphasize the high death rate among younger animals. Thus, over a series of years nearly two-thirds of the mortality in sheep is in young stock, and in goats about three quarters of it. Other figures show that both in sheep and goats the mean annual mortality rate is two to four times higher in the young than in their dams. The bulk of the deaths occur in the first three months, the death rate in males being higher than in females.

There are suggestions that (a) mortality in weaned kids is higher than in unweaned, (b) mortality both in ewes and lambs is relatively higher when the ewes are allowed to lamb twice in the year.

At several of the sheep farms helminthic disease is an out-standing source of mortality, while effect of environmental, nutritional and climatic, in this connection is emphasized. The death rate from helminthic disease, both in sheep and goats, seems to be at its worst from first six months to two years and especially at 6 to 12 months. In goats the majority of deaths occurred before the age of six months.

As to seasonal effect, the numbers of cases and the conditions on the farms are sometimes so different that no general statements can be made. Deaths in farms and kids up to six months of age are usually more frequent in

the colder weather, after making due allowance for the season of birth. Similarly, death in older sheep from helminthic disease and pneumonia are highest between October and March. Other examples of seasonal incidence are; in lambs at Hissar a condition styled encephalo-myelitis in May to June, in kids at Etah a condition attributed to *Pasteurella* in April to August, sheep-pox April to September, an obscure disease of sheep at Quetta April to July.

Other information noted in passing are, (a) that with kids male births are proportionately greater than female; (b) of nearly 2000 goats kiddings at Etah and Hissar 55 per cent give twins.

* * *

Lead as a nutritional hazard to farm livestock. III. Factors influencing the distribution of lead in the tissues.—By K. L. BLAXTER, Ministry of Agriculture, Veterinary Laboratory, Weybridge, Surrey. *J. Comp. Path.* **60**, 177. (Authors' summary)

Following the injection of lead into the vein of a sheep, it was found that the whole blood concentration dropped very slowly. The lead content of the corpuscles dropped at a slow exponential rate, while the lead content of the serum, although dropping initially much more rapidly, also declined very slowly.

It was found that in normal sheep and in sheep given small and large quantities of lead by mouth the cells accounted for 85 to 90 per cent. of the blood lead. *In vitro* studies on cow blood indicated that the cells accounted for 63 to 70 per cent.

On the basis of ultra-filtration studies and analysis of protein-free fluids from rabbits, it was concluded that very little of the serum lead is freely diffusable, the larger part being bound to the serum proteins.

The distribution of lead following both oral and intravenous administration was determined in the tissues of rabbits. It was found that lead when given intravenously as the acetate followed the distribution of the reticulo-endothelial cells of the body. When given by mouth, most of the lead was found in the skeleton with very high concentrations in the kidney. The carcase analyses of two sheep agree with this differential distribution.

With increasing oral dosage the amount of lead stored in the bones increased, but there was an indication that the bone cannot deal with large excesses which are then deposited and cause damage in the kidney, particularly the cortex.

After the intravenous administration of lead, there was still 5 to 10 per cent. present in the tissues 59 days after the injection.

The results are discussed in relation to the factors causing the differential distribution of lead and its implication.

* * *

Lead as a nutritional hazard to farm livestock. IV. Distribution of lead in the tissues of bovines after ingestion of various lead compounds.—By RUTH ALLCROFT, Ministry of Agriculture, Veterinary Laboratory, Weybridge. *J. comp. Path.* **60**, 190.

(Authors' summary)

Analytical data were obtained showing the normal concentration of lead in selected tissues and blood of cattle and sheep. It was pointed out that while the concentration of lead in the tissues was similar to that in the human being, the amount of lead in whole blood was considerably lower than in man.

When large quantities of lead were given to calves there was a marked and rapid rise in the blood lead and if the animal survived the lead content of the blood did not revert to normal for many months.

Data on the concentration of lead in the blood stream has been used to compare the amounts of lead absorbed from various lead compounds by the calf. When given as the metal or the finely ground ore galena, lead was absorbed to a much smaller extent than when given as the acetate, the phosphate, the basic carbonate, the oxide and wet or dry paint.

Tissue concentrations of lead after ingestion of various lead compounds showed that the amount of lead in the kidney cortex was of specific diagnostic value.

Comparison of blood and faecal lead levels were made over a period of several weeks after ingestion of sub-lethal amounts of lead. It is pointed out that such a comparison is of considerable diagnostic value in cases of suspected lead poisoning in the living animal.

Experiments on attempted chronic poisoning of bovines with lead are presented. Relatively large quantities, 1 to 2 g. daily, were ingested over a period of two years without ill effect.

* * *

Lead as a nutritional hazard to farm livestock.—V. The toxicity of lead to cattle and sheep and an evaluation of the lead hazard under farm conditions. By Ruth Allcroft and K. L. BLAXTER, Ministry of Agriculture, Veterinary Laboratory, Weybridge. *J. comp path.* **60**. 209.

(Author's summary)

Experiments in which the lethal dose of lead for calves and sheep was investigated using various compounds showed that in the case of young calves 0.2 to 0.4 g.Pb per kg. of body weight was sufficient to cause death in a few days. The fatal dose for older cattle and mature sheep was larger.

The symptoms of acute lead poisoning in cattle and sheep are described. Field cases of acute poisoning are enumerated, and it is suggested that large

numbers of calves die annually throughout the country as the result of the ingestion of toxic quantities of lead. Lead paint and painters' materials were the most frequent cause of death, but cases also occurred through contamination of feeding stuffs.

It has been shown by experiments on continued daily ingestion of lead that the very substantial dose of 8 mg. per kg. body weight may be tolerated for many months, and that a level of 6 mg. per kg. of body weight per day may be tolerated for even three years.

On the basis of a single experiment it is suggested that much smaller amounts of lead, 1 mg. per kg. per day, are sufficient to cause abortion in the ewe if ingested during pregnancy by animals in poor condition.

Pasture levels of lead are discussed, and it is shown that the ingestion of herbage contaminated with plumbiferous soil dust in certain areas can result in the ingestion of more than 130 mg. of lead for every kg. of dry mattter consumed. The average annual ingestion of lead by sheep in the plumbiferous area of Derbyshire is high, the amount being much greater in winter than in summer. Lead in this form, however, is relatively non-toxic and the lead content of the blood of sheep in this area suggests that there is no real danger of any form of plumbism.

It is concluded that cumulative lead poisoning rarely, if ever, occurs in ruminants, and that in this respect ruminants differ from human beings.

Diagnosis of lead poisoning of the acute type is briefly discussed, and it is emphasised that an unequivocal verdict on analytical data alone, without collateral evidence, is often difficult.

* * *

Macleod J. & Ponder, E. (1946). Red-cell content of blood of the thoroughbred-horse.—*Science.* **103** 73.

A comparison was made between samples of blood from Thoroughbred and other horses: in one test five of each kind were used, the experimental results being recorded in two tables. The red cell count and haemoglobin content of Thoroughbreds are higher than the corresponding values in non-Thoroughbreds, the red cell count for which is 6–8.5 million. The cells of the Thoroughbred are smaller, the concentration of haemoglobin is a little less; and therefore they carry less haemoglobin per cell, but of the two types of horses the Thoroughbred carries more haemoglobin per ml. of blood because there are more red cells per unit volume and this condition is probably a genetic characteristic. E. M. J.—*Vet. Bulletin*, Vol. 21, No. 6.

* * *

Studies on gestation periods in Tharparkar cattle.—By A. C. CHAUDHURI, and C. SINHA, *Ind. J. Vet. Sci. & Ani. Hus.*, Vol. XXI, Part 11. (Authors' summary)

In Tharparkar cattle 1146 gestation periods were studied. The mean gestation period is 287.15±34 days. The mean gestation period when male calves are born is 288.50±46 days. The mean gestation period when female calves are born is 285. 80±48 days.

There is a slight variation in the gestation period according to the season of calving. The gestation period appears to be slightly affected by the age of the cow at the time of calving. The mean birth weight of the male calves is slightly more than that of the female calves.

Association News

U. P. VETERINARY ASSOCIATION

Proceedings of the 18th Annual General Conference of the U. P. Veterinary Association held at Rampur from 12th to 15th February 1952.

About 200 delegates, Veterinary Assistant Surgeons, Veterinary Inspectors, District Livestock Officers, from all over the State attended the Conference. The Director, Deputy Directors and officers of the Department also participated.

The Conference commenced at 2-30 P.M. on Tuesday the 12th February 1952 in the U.P. State Livestock Show's Pandal at Rampur, under the presidentship of Sri H.B. Shahi, M.R.C.V.S., Animal Husbandry Commissoner U. P.

On the arrival of the Hon'ble Minister for Animal Husbandry and Agriculture, Sri Tej Bahadur recited the National Anthem. After this the Chairman, Reception Committee, Sri S.M.H. Naqvi, read the following address:—Hon'ble Minister Sri Charan Singh, President, Colleagues, Guests and Gentlemen,

On behalf of the U.P. Veterinary Association, I extend to you one and all assembled here a cordial and hearty welcome.

We are extremely fortunate, in having the Hon'ble Minister for Agriculture and Animal Husbandry in our midst to inaugurate this conference. We shall look forward to his valuable advice and guidance

coupled with support for advancement of profession and veterinarians alike. We depend on his sympathy and justice. I thank him for accepting our humble invitation at such a short notice and for the trouble he has taken to find it possible to grace the occasion by his presence in our midst this evening inspite of his multifarious and onerous duties.

This year we have been very fortunate in having Sri H. B. Shahi in our province as Animal Husbandry Commissioner. It is a great boon to the Department to have a man of Sri H. B. Shahi's capabilities and integrity. To many of us he is not new and those who will meet him now will certainly, like us, have such endearing and cherished memories of him.

I thank Dr. R. L. Kaura for his keen desire to help the Association in all aspects of its activities in general, and each individual member of the department in particular. His fraternal equality for all ranks of the department, and his paternal illuminative and instructive guidance, bestowed upon us with ever-ready willingness have endeared him to one and all and it is the greatest of all blessings in having him as head of our department.

To my colleagues, delegates and fellow professionals, who have at considerable expense and inconvenience graced the occasion by their much needed presence, I find it an immense pleasure in heartily welcoming you all, offering sincere thanks on behalf of the Association and on my own behalf.

The shortcomings in the arrangement for your reception and inconveniences of lodging and other necessities are very much regretted and your having to put up with all these shortcomings and inconveniences without even feeling them that way and much less to make a mention of them, fills my heart with great admiration for your earnest zeal and sincere devotion for the cause of our Association, for which we have assembled here this evening from all over the Province.

To all our honoured guests, ladies and gentlemen, who have greatly honoured us by their presence at considerable inconvenience in accepting our humble invitation I extend a warm welcome.

The return of Sri H. B. Shahi, to U. P. from Madhya Pradesh where he was the Director of Agriculture and Animal Husbandry, has been very timely at this juncture, when we are clamouring to preserve our well earned status and position, which is at stake due to the creation of disparity in the pay scale of Diploma and Degree holder Veterinary Assistant Surgeons.

The Association as a body of men who are the true representatives of about 95% of the present departmental cadre and each individual as a member of this honourable, but neglected profession looks towards him with

hope and expectancy to be saved and spared from the manifold ills that are bound to be the sequence of the disparity created between the members performing similar duties and shouldering equal responsibilities by dividing them in two highly segregated pay groups.

We fully appreciate the zeal of our popular Government in furthering the progress and prestige of U. P. College of Veterinary Science and Animal Husbandry, Mathura, by announcing a higher scale of pay to attract candidates of higher efficiency in greater numbers. Until the new scale was announced the admissions gradually dwindled away and it became a matter of great concern to the authorities to find the first Veterinary College of the Province, which came into existence after an already overdue delay and with considerable difficulties and large investment, running short of admissions.

Looking at things fairly and squarely, and speaking nothing but truth in its true perspective, I may be allowed to point out here that our clamouring for the last many years to raise our pay scale, which alone determines the status of any service, was considered as an uncalled-for demand, until the Pay Committee's generous gesture brushed us aside with an eye wash, in view of the tremendous increase in per capita cost of living. But once the Government had boldly taken up the responsibilities of running the State Veterinary College it realised within three years of its conception that unless better emoluments were offered for graduates of this particular college, the institution may find itself without any students to teach in time to come. Government's realization that the graduates of Mathura Veterinary College must get a distinctively higher salary is a matter of great consolation to us for we know that a thing which is well begun is half done.

We had failed to make the Government realise all these long years that suitable hands do not come forward because of this shameful paltry salary offered to a Veterinarian. Since the Government have now realised it although specifically only for the Veterinarians from Mathura Veterinary College we now have the onerous task of convincing the Government that we Diploma holders and other degree holders from other Colleges than Mathura are also Veterinarians who have been serving the Department from its earliest days until today to bring it from its humble origin to its present position. We are rightly proud of it not so much for bringing it to its present premier position in the State, but more so for handing it over to the new degree graduates in its well trimmed shape, where we shall work shoulder to shoulder sharing equal responsibilities and performing similar duties in the regime of our popular Government, for higly unequal salaries and privileges.

Under the newly set up scales of pay, a Veterinary Assistant Surgeon who has put in as many as twelve years of service will draw a pay

lesser than a fresh Mathura Veterinary college graduate on his appointment in the Department. Further a District Livestock Officer who has well earned his promotion to his present post after faultless service of about fifteen years and has greater responsibilities to shoulder than a Veterinary Assistant Surgeon will get the same pay as a newly appointed Veterinary Assistant Surgeon hailing from Mathura Veterinary College.

It will not be out of place to mention here the procedure adopted by the sister department of this State, the Medical and Health Department, no sooner was it found necessary, for almost similar reasons of course, to give higher salaries to the Medical Degree Graduates, the authorities concerned considered the position of the hmble Licentiates and had offered promotion to all the members in the service, who had put in ten years of service, bringing them all in the same scale of pay as a fresh Medical Graduates from any College. Keeping in view the large cadre in the Medical and Health Department the authorities concerned could not have done any better in the interest of Medical Licentiates. But the picture in the Animal Husbandry Department is much different where the total strength is only a couple of hundred, who have no other source of income like private practice etc. of medical men, to count upon and have to live entirely on the paltry salary offered to them. The gesture shown by the Medical Department to its Licentiates is well worth a consideration by the authrorities concerned for the betterment of humble Veterinary Assistant Surgeons with diploma qualification.

The diploma holders have not only been unfortunate in receiving no consideration when a higher starting salary was found necessary for the Mathura Veterinary Graduates. How true it is that misfortune never comes alone!

To mention a few, the Department has already summoned and interviewed twenty one degree holders from amongst the Veterinary Assistant Surgeons for the selection of two candidates for M.R.C.V.S. course abroad. This has made it painfully clear that the humble diploma holders in spite of their devoted services and various distinctive, individual and collective achievements in all the activities of the Department have been completely ignored.

In all fairness, open competition in any shape and form for any reward is the choicest measure, but choose-at-will for any reward, and more so for such a prize as overseas studies, is any thing but fair. In the hour of need in almost all the degree colleges for Veterinary Science in India, the services of capable diploma holders were utilised in teaching the classess for Veterinary Degree. In the College of Veterinary Science at Mathura there are still many Diploma holders on the teaching staff—but alas—soon after the degree has been obtained by the taught he becomes

superior to his diploma teacher in all respects, under the roof of that very College and in the Department of this very Province.

Diploma holders have never believed in any aspect of vanity and have shown ever-ready willingness to learn more and more. We were given a glimpse of hope by the Director of Animal Husbandry, U. P., at the Seventeenth Annual General Meeting in 1950 that arrangements were afoot for a condensed course of one year's study which will be open to the diploma holders at the Mathura Veterinary College to enable them to obtain the degree. This was the result of untiring efforts of Dr. R. L. Kaura, Director of Animal Husbandry, U. P. and Sri P. G. Pande, Principal, U. P. College of Veterinary Science and Animal Husbandry, Mathura. We are greatly indebted to them for their zeal and sincerity aimed towards the betterment of our lot. But now impediments have been put in the way of this progress. The Agra University has laid down a specific condition that unless a diploma holder is Intermediate Science with medical group subjects he will not be entertained for the condensed course in the said College.

There is a ready analogy in the Medical and Health Department of Uttar Pradesh, whereby scores of Medical Licentiates have already completed a condensed course and have obtained the degree of M.B.B.S. from the same Agra University without the specific condition that a Medical Licentiate should be an Inter Science with Medical group subjects. All the Medical Licentiates who wanted to take up the condensed course were allowed to do so, strictly in the serial order of the receipt of their application in the office of the Director of Medical and Health Services, U.P., and were given the facilities in terms of Study Leave Rules. Further to give them the necessary facilities at both the Medical Colleges, i.e., Agra, and Lucknow, speedy arrangements were undertaken. The Private Practitioner Licentiates also were given full recognition and about 15% seats in both the colleges were reserved for them, giving scholarships to those who were ready to sign a bond for a short term service in the Department after the completion of the condensed course. Still, in spite of this precedence in a sister department, it is a matter for deep regret that the Veterinary Assistant Surgeons who are diploma holders are denied the facilities for taking up the Veterinary degree through the condensed course.

We hope that through our sincere well-wishers the Hon'ble Minister, the Animal Husbandry Commissioner, the Director of Animal Husbandry and the Principal, Veterinary College, our voice will reach the Chancellor, Vice-Chancellor, and other authorities of the Agra University and that they would be pleased to review their decision in regard to the eligibility for Veterinary condensed course and give us the same facilities as are given for the Medical Licentiates to take up the M. B. B. S. condensed course. We also hope that the sound principle enunciated and recommended by the

U. P. Pay Committee—that the member of any service engaged in similar nature of duties and shouldering equal responsibilities must of necessity get the same remuneration—will receive the due and timely consideration of the authorities.

I have already taken much of your precious time. I thank you all on behalf of the Association and on my own behalf for giving a very patient hearing to this long and tiresome but a necessary and humble narration.

The Hon'ble Minister for Animal Husbandry and Agriculture, Sri Charan Singh, in reply to the above address, first stressed the need for the frequent use of our national language, Hindi, and then emphasised the necessity of plain and simple living. He exhorted the members to put in their best in the service of cattle wealth and thereby to our motherland—India. The Hon'ble Minister showed his willingness to remove the disparity caused by the new scale of pay given to the Graduates of Mathura College on their appointment as Veterinary Assistant Surgeons in the State. He assured them that he would adopt some suitable means to solve this problem at an early date.

Lastly the Hon'ble Minister wished the Conference and all those concerned every success and promised his whole hearted support in all ways. He then declared the Conference open.

After this inauguaral speech, Sri H. B. Shahi in his Presidential address tendered some very remarkable advice to the assembled Veterinarians. He illustrated 3 modes of discharging the duty viz. one in lieu of pay received, the other taking it as duty and the third in response to the call from the Soul and exhorted the members of the profession to discharge their duties faithfully as defined in the third form by merging their own entities with the cause. "When we go to a village" he added "We should try to win over the village people by love, by mixing with them and by sharing their joys and sorrows." He described our Profession a noble one, better than others. He stressed the vital necessity of healthy livestock for this country. Sincere work with correct and timely approach will soon lead to achieve this goal. He advised that the Association should not only take up the pay problem and put up before the Minister their greivances in this way but such difficulties and troubles should be dealt with in some suitable way, adopting the correct and proper procedure for which he was always ready to support as best as he can. "The Association" he added, "should sincerely consider the means and ways of improving the livestock of this country *e.g.* by unity, efficiency, devotion to duty, discipline, individual effort and initiative. This will ultimately bring better living, great happiness and respect in the eyes of the world. Concluding, he wished the Conference every success.

In the end Sri R. P. Sinha, President of the U. P. Veterinary Association, thanked the Hon'ble Minister, Animal Husbandry Commissioner, Chief Guests, Visitors and the delegates for gracing the Conference with their kind presence. The House then adjourned to meet again next day. All were entertained to light refreshments arranged by the Association.

Wednesday, the 13th February, 1952.

The Second day's proceedings started at 9 A.M. with Sri R.P. Sinha, President of the Association, in the Chair.

The House passed unanimously, all standing, the resolution of condolence (Appendix A) on the sudden and sad demise of Sri B.K. Roy. District Livestock Officer and S. N. Dutt, Veterinary Assistant Surgeon.

The House passed unanimously the resolution of congratulations (Appendix A) to the following on their promotion—Sri R. N. Mohan, K. G. Rao, J.L. Govil, K. C.Sen Gupta, K. A. Raza, J. S. Srivastava, M.G. Sinha, J. Purohit, J.P. Joshi, Anwarduddin, M.N. Molasi, H. C. L. Kakrania, E. S. David, E. C. Rawson and R. S. Misra.

The minutes of the last Annual General Conference were then read and confirmed.

The General Secretary Sri K.A. Raza presented his Annual report including the report of the Financial Secretary and the Audit note for 1950-51.

It was decided that in future the reports of the General Secretary, Financial Secretary and the Chief Editor, U. P. Veterinary magazine should be written and placed before the House.

The objections as raised by the Auditor should be classified and efforts should be made to minimise them in future.

Further it was resolved :—

1. That the proceedings of the Executive Committee, the General Conference and other meetings should be circulated to all members through the U.P. Veterinary Magazine.

2. That 10% of the annual income of the Association should be kept aside each year as fixed deposit. At the time of great emergency, necessary amount from the fixed deposit may be drawn only with the consent of the General House.

As the Chief Editor of the U. P. Veterinary Magazine was not present and his report also was not received by this time it was decided to request the Chief Editor to please forward his report for the period at an early date to the General Secretary for necessary action.

The House approved the affiliation of the U.P. Veterinary Association with All India Veterinary Association as decided in Resolution No. 4 of the Executive Committee's meeting dated 16th September, 1951.

The formation of the Indian Veterinary Council was decided.

At this stage the members dispersed for lunch to meet again in the afternoon.

February 13, 1952—3 P.M.

The members met again at 3 P.M. The following gentlemen presented the papers noted against them and this was followed by a lively discussion in which all the members took great interest.

1. Sri H. C. Joshi, Gaushala Development Officer, on Development of Gaushalas.

2. Sri M. A. Qureshi, Senior Poultry Inspector (Headquarters) on 'Poultry Development in Uttar Pradesh.'

The House then considered the revision of the pay scale of the Diploma holders. After a prolonged discussion, this was referred to a Sub-Committee of 4 persons viz. Sri S. M. H. Naqvi, Tej Bahadur, Jagdish Singh and K. A. Raza to decide the suitable action to be taken in the matter and place the same before the House on the following day.

The House then adjourned to meet again next day.

Thursday, the 14th February, 1952.

The House met at 3 p.m., discussed and passed the report of the committee (formed on 13—2—52 to consider the revision of the pay scale of the Diploma Holders)—vide Resolution No. 7 in Appendix A. The House then took up other resolutions and passed them unanimously as on Appendix A. After a talk on "Importance of Key Village Scheme" by Sri H. C. Joshi, Gaushala Development Officer, U. P., the meeting was adjourned to meet again the following day.

Friday, the 15th February, 1952.

The House re-assembled at 3 p.m. Sri P. Bowel, Veterinary Assistant Surgeon, Poultry Section, Headquarters, Lucknow, gave a talk on "Poultry Diseases."

Sri Ibne Hasan, Veterinary Assistant Surgeon, read an article on "Environments as important as Breeding or diet" sent by Sri B. P. Verma i/c Livestock Central Dairy Farm, Aligarh.

All the members had a lively discussion on the above subjects.

The remaining resolutions were taken up and passed—Vide Appendix A.

The House suggested that Practical Demonstration with technical lectures should also be arranged in future during the Annual General Conference.

The Election of the office bearers, members of the Executive Body, Editor etc. was taken up and the following were elected unanimously to the various posts :—

President	...	Sri P. N. Bhal.
Vice-President	...	„ S. M. H. Naqvi.
General Secretary	...	„ K. A. Raza.
Joint Secretary	...	„ Jagdish Singh.
Finance Secretary	...	„ H. C. Joshi.
Auditor	...	„ Vidya Prakash.
Chief Editor	...	„ K. G. Rao.
Joint Editor	...	„ Tej Bahadur.

Members of the Executive Body.—

1.	Sri R. L. Arora.	7.	Sri R. S. Misra.
2.	„ Mohd. Malik.	8.	„ L. M. Devedi.
3.	„ Rao Mussaddi Singh.	9.	„ P. C. Mukerji.
4.	„ D. S. Tomar.	10.	„ S. S. Ahmad.
5.	„ G. P. Barthwal.	11.	„ S. S. Raj Kumar.
6.	„ R. P. Sinha.	12.	„ Ram Autar Singh.

The newly elected office-bearers took up their seats and the Conference came to an end with a vote of thanks to the President and the delegates.

APPENDIX A

The following resolutions were passed unanimously :—

1. Resolved that this house offers its heartfelt condolences on the sudden and premature demise of the following members and conveys its sympathies to the members of bereaved families :—

Sri B. K. Roy, District Livestock Officer and Sri S. N. Dutt, Veterinary Assistant Surgeon.

2. Resolved that this house sincerely congratulates the following receipients of promotions : Sri R. N. Mohan, K. G. Rao, J. L. Govil, K. C. Sen Gupta, K. A. Raza, J. S. Srivastava, M. G. Sinha, J. Purohit, J. P. Joshi, Anwaruddin, M. N. Molasi, H. C. L. Kakrania, E. S. David, E. C. Rawson and R. S. Misra. Further resolved that letters of congratulation be sent to each of the above gentlemen and they be requested to contribute some suitable donation to the Association on this happy occasion.

3. Resolved that the proceedings of the Executive Committee, the General Conference and other meetings should in future be circulated to all the members through the U.P. Veterinary Magazine.

4. Resolved that 10% of the annual income of the Association should be kept aside each year as " Fixed Deposit ". At times of great emergency, necessary amount from this Fixed Deposit may be drawn but only by the consent of the General House.

5. Resolved that the Govt. be requested to expedite the Provincialization of the Veterinary Hospitals of the State as the maintenance of the Veterinary Hospitals by local bodies is deplorable as regards the supply of medicines, equipments etc.

6. Resolved that the Govt. be requested to expedite the enactment of the Bill for " Control of Cattle Contagious Diseases " already under consideration.

7. Resolved that this Conference reiterates resolutions Nos. 2 and 3 passed by the Executive Committee on 16-9-51 and further resolved that the Executive Committee particularly the Secretary and the President should take such necessary and effective steps which may bring about an early equalization of the pay scale of Group II Cadre and the revision of the pay scale of Group I Cadre.

8. Resolved that the Animal Husbandry Department be requested to conduct an open selection by inviting application for further studies and trainings.

9. Resolved that the Govt. be requested to keep District Livestock Officers in every district to facilitate the development work under the new planning Schemes.

10. Resolved that the Govt. be requested to take early action on the Resolution No. XXXV passed by the House on 16-10-46 which runs as follows :—

Resolved that no licence for plying the Hackney Carriage be granted unless the animal and the harness is passed by a Veterinary Graduate as fit for use.

11. Resolved that the Govt. be requested to provide a Veterinary Mobile Unit at every District Headquarters under the charge of District Livestock Officer.

12. Resolved that the Animal Husbandry Department be requested to take early action on the Resolution No. XXXIX passed by the House on 16—10—46 which runs as follows :—

Resolved that due to expansion of the department and its change over to the Animal Husbandry Department an Animal Husbandry Manual be prepared in consultation with this Association or its representative to be selected by the Executive Body of this Association.

13. Resolved that the Govt. be requested to open Quarantine Stations on the borders of the State along cattle-routes to check the spread of diseases through movement of cattle.

14. Resolved that an Animal Husbandry Association be formed in order to cover all other expanded sections of activities of the Animal Husbandry Department. This Animal Husbandry Association may include all other existing associations or those which may be formed later on *e.g.* U.P. Veterinary Association, U.P. Stockmen's Association, Fishery Association, Poultry Association etc. keeping in view that it does not in any way affect the interest of the individual association particularly with the affiliation of the U.P. Veterinary Association with the All India Veterinary Association or with the Indian Veterinary Council.

A Sub-Committee of the following 3 persons be formed with power to co-opt 2 persons if necessary to frame Rules and Regulations etc., of the said Animal Husbandry Association.

Sri H. K Lall, Chairman,
Sri D. S. Sarbahi, Member,
Sri K. A. Raza, ,,

Further resolved that the reports of this Sub-Committee in detail be placed before the next Conference of the General House.

15. Resolved that the question of Taxation of Departmental staff by the local bodies should be considered by the Executive Committee.

P. N. BHAL,
President,
U. P. Veterinary Association.

THE PUNJAB SUBORDINATE VETERINARY SERVICE ASSOCIATION

Proceedings of the 14th Annual General Meeting of the Punjab Subordinate Veterinary Service Association held on the 30th March 1952.

The 14th Annual General Meeting of the Punjab Subordinate Veterinary Service Association was held on the 30th of March, 1952, at 10 A.M. in the Temperance Hall, Amritsar.

Besides the delegates from different parts of the State, the following gentlemen, in response to the special invitation, also attended the Conference.

1. S. Mool Singh, P. V. S. (Class I-Retd).
2. S. Ajaib Singh, P. V. S. (Class II) Dy. Supdt : C. V. D. Amritsar
3. S. Indar Singh, P. V. S. (Class II) Dy. Supdt : C. V. D. Jullundur
4. Dr. F. C. Shourie of the Punjab Medical Council, Amritsar.
5. Dr. C. L. Bhatia, Amritsar.
6. Dr. Miss. Vine, Hony. Secy. of the S. P. C. A. Amritsar.

S. Gurdial Singh Dhillon, Advocate and M. L. A., was in the chair.

Dr. Karnail Singh, Chairman of the Reception Committee, welcomed the delegates and thanked the gentlemen who were attending the Conference. In his address he said that India owned one-third of the cattle population of the world and derived two-third of the national income from animals and yet Rs. 115 crores were wasted annually on the maintenance of useless cattle.

Nowhere in the world was there greater veneration for the cow than in India, and yet nowhere else was she so neglected, he said. Their breeds of livestock had degenerated so much that an Indian cultivator had to put 22 bullocks to do the job done by three in Egypt.

Agriculture and livestock were complementary. While much stress was being laid on production of food, very little was being done for obtaining subsidiary foods from milk. Wherever livestock was a flourishing industry, people were healthy, sturdy and prosperous. Malnutrition sapped the vitality of a nation.

He deplored the low milk yield in India, which, per cow, was 413 lbs. against 7,559 lbs, in Netherlands, 7005 lbs. in Denmark, 6,498 lbs. in Switzerland and 5516 lbs. in U. K. He also deplored the low egg-production in the country.

In the Punjab, they needed 14,421 buffalo bulls and 10,642 bulls, whereas they had only 3,454 and 6,544 respectively. He regretted that thousands of animals died annually through preventable diseases and wanted the veterinary service to be expanded.

Dr. Bishamber Dass Bahl expressed great satisfaction and thanked S. Gurdial Singh Dhillon for presiding over the deliberations of the Conference. He narrated the good qualities, the honest, hard and fearless working of Sardar Sahib and expressed the hope that the Honourable Member will leave no stone unturned to improve the lot of the poor veterinarians who have been so hard hit by the abnormal times.

In the ordinary civic life, he said, the Veterinarians must have a place in the District Boards, Local Bodies and Representative Assemblies too. In the end, Dr. Bahl thanked the members of the Managing committee for their co-operation during his tenure of Presidentship of the Association.

Dr. Miss Vine, Honorary Secretary of the S. P. C. A., referred to the useful work being done for animals by her organisation. She made a commendable reference to S. Ram Singh, Dr. J. N. Saini, Dr. J. N. Nagar and Dr. R. L. Gulati for the services rendered to the S. P. C. A. Amritsar when they were in-charge of the Civil Veterinary Hospital, Amritsar. She explained that as 'Red Cross' stands for service to the injured human beings, the 'Blue Cross' stands for service to the animals.

Dr. F. C. Shourie, President of the Punjab Medical Council, urged closer liaison between doctors treating human ailments and animal diseases and also urged research into animal diseases, as human beings contracted many diseases from animals. He advised the members of the P. S. V. S. Association to work in closer harmony for the uplift of their profession and put in an united front for the major demands such as better emoluments (scale of pay and allowances), improved residential accommodation etc.

Dr. Amar Singh read his annual report on the working of the P. S. V. S. Association for the year 1951-52 in which he explained his difficulties and how he surmounted them successfully. He thanked the *Editor* of the *Indian Veterinary Journal* for giving ample space for publishing the proceedings of the 13th Annual General Meeting. The reply for the resolutions submitted to the Govt. was read to the members.

During the year 1951-52 the membership of the Association had gone up to 111 and an appeal was made to the veterinarians to enlist themselves as members of the P. S. V. S. Association to make it more representative.

As regards the finances of the Association, the income during 1951-52 was Rs. 510/8/-, as against expenses of Rs. 213/3/3, thus leaving a balance of Rs. 297/4/ only on hand.

In the end he expressed his thanks to Dr. J. S. Chattwal and Dr. L. R. Chawla for their active help and co-operation.

This was followed by professional papers.

Dr. Nahar Singh Garewal in-charge Poultry Sub-station, Kangra, read a paper on "Poultry common diseases, their diagnosis and treatment". His diagnostic chart of important poultry diseases was very much appreciated.

Dr. Garewal also read a poem on this occasion. Every verse in the poem was so touching that the poet of the hour received much applause.

Dr. D. D. Khorana, V. A. S. incharge C. V. H., Jaghadari, gave his experiments regarding Stilboestrol treatment in heifers which did not come to heat at all. His results were very encouraging and he reiterated that further experiments in his opinion will show a higher percentage of calving rate.

The next item on the agenda was resolutions from the members. The following resolutions were moved, seconded, discussed and passed unanimously.

RESOLUTIONS

No. 1. We the members of the Punjab Subordinate Veterinary Service Association humbly request the Punjab Government through the Director, Veterinary Services and Warden of Fisheries, Punjab, that Shri Ishwar Chandar's case regarding special pension should be considered most sympathetically, as the said V. A. S. got this disability during the performance of his legitimate duties.

No. 2. This meeting of the P. S. V. S. Association is of opinion that on account of the importance of livestock development in India, it is imperative, that a Veterinarian should be nominated to the Punjab Legislative Council. Therefore it humbly requests H. E. The Governor of Punjab to be pleased to nominate Veterinarians to the Punjab Legislative Council out of the experienced persons from the State.

No. 3. It was unanimously decided to meet the D. V. S., Punjab, the Hon'ble Minister for Development and Hon'ble The Chief Minister to place our case regarding grades etc., before them in the form of a Memorandum.

No. 4. This Association endorses the resolutions Nos. 2 to 6, 9 and 13 passed at the 13th Annual General Meeting and requests the D. V. S. Punjab for their reconsideration on merit.

No. 5. (2) We the G. P.V.C. members of the Subordinate Veterinary Service Association humbly beg to approach the Government through this resolution that their present grade is quite meagre as compared with bulk of work they perform in the hospitals and in the field. We therefore request the Government that these cases may be considered on merit and we may be placed on par with the L.V.P. and granted the scale of Rs. 100-10-200/10-300 instead of Rs. 60-5-90/5-130-160. We assure the benign Government that we will continue to discharge our duties more faithfully.

No. 6. (3) Resolved to request the Director, Veterinary Services, Punjab, to kindly reconsider and cancel the orders issued in the memorandum No. 112-116/C/33. I. G. dated 10/3/1946 to the Circle Superintendent, and the head quarters leave on the gazetted and local holidays may kindly be granted to the veterinary staff as usual, as the veterinary hospitals are always required to remain open even when the staff is granted leave or is on tour.

No. 7. (4) Resolved to request the Director, Veterinary Services, Punjab, to kindly permit the Subordinate Veterinary Staff to engage in private practice subject to the conditions imposed on the Deputy Superintendent, in the 5th paragraph of the veterinary circular No. 5. This will bring us on par with the Staff of the other States, keep up the prestige, honour to the department and afford us an opportunity to add to our income, though small, but legtimate in these hard days. This will create added interest amongst the member of the staff to keep their knowledge upto date.

No. 8. (5) Resolved to move the D. V. S. Punjab to sanction closing of Veterinary Hospitals on Sundays for outdoor work, as is the case in every other department. Indoor cases and emergent cases shall however be treated.

No. 9. (6) Resolved to request the D. V. S. Punjab to provide the following accommodation in residential quarters :—

1. V. A. S. Quarters :—3 rooms, 1 store, kitchen, bath, latrine and a cattle shed.
2. V. C. Quarters :—2 rooms, kitchen, bath and latrine.

All previous quarters should be remodelled and all new ones constructed on the above scale.

No. 10. (9) Resolved that Punjab Government be requested to improve the grades of Veterinary Assistant Surgeons to the grade of Rs. 160/10/330/15-450 which is prevalent in case of I.C.A.R. employees, as the present grade of Rs. 100-10-300 was sanctioned in 1924 when the economic conditions and cost of living were easy as compared with present day hard conditions, when the prices of necessaries of life have been enhanced by 700%

No. 11. (10) Resolved that Punjab Govt. be requested to declare all Veterinary Assistant Surgeons as Milk and Meat Inspectors under the Pure Food Act and also further instruct the local bodies to avail of their services in this matter, because all veterinary assistant surgeons are fully qualified in these subjects.

No. 12. (11) Resolved that in order to make the running of the department more efficient and effective, the D. V. S. Punjab be requested to appoint a committee of nominated members of the Subordinate Service Association and a few of the departmental officers to consider difficulties arising out in the discharge of routine duties of the subordinate staff and find out means to solve them.

No. 13. (12) Resolved that the S. P. C. A. Act may be extended to all over Punjab and the powers thereunder conferred on the veterinary assistant surgeons, where such S. P. C. A. exists or where such Societies are started hereafter.

No. 14. (13) Resolved that the Punjab Government be requested to sanction suitable house rent allowance or other compensation allowance for all the Veterinary Assistant Surgeons who are selected to work as Research Assistants, Demonstrators in the college, Dairy Bactrologist, Dairy Assistant and the farm V. A. S. in the office, R. V. A. S. or in any other special post in the Subordinate Service as this concession is being enjoyed by their colleagues who are working in the field or as Research Assistant at the Goverament Livestock Farm, Hisar and Poultry Farms in the department. This would encourage them to stick to their post for which they have been considered particularly suitable and will avoid unnecessary discontentment and heart-burning.

President's Remarks

Presiding over the 14th annual conference of the Punjab Subordinate Veterinary Service Association S. Gurdial Singh Dhillon M. L. A. said that livestock formed an important part of the country's economy.

Although the percentage of cattle per capita, per acre was higher in India than in other countries, he regretted that the average life of cattle in India was shorter. It was shocking that human life here was short, but cattle life was shorter still.

He expressed his sympathy with the demands of the subordinate veterinary association, and urged the Government to give greater attention to employees of certain beneficent department like teachers, veterinarians and the agricultural staff. He wanted early revision of their pay scale.

He saw no harm in the veterinarians taking to private practice after office hours and also expressed his sympathy with their demand for a weekly holiday. He urged them to do their duty in the spirit of service to the country.

Then the house adjourned to meet again at 3 p.m. for the afternoon session.

The Afternoon Session

The afternoon session was held at 3 p.m. in the same Hall. Dr. Bishamber Dass Behl presided.

The election of the office bearers and members of the Executive Committee and Auditors for the year 1952-53 took place. The following office bearers were elected :—

1. Dr. Karnail Singh, Amritsar—President
2. Dr. S D. Sharma (Panipat)—Hony. General Secretary.
3. Dr. Sadhu Singh, Amritsar Distt—Joint Secretary.

Executive Committee Members

1. Dr. D. D. Khurana, (Jaghadari)
2. Dr. Amar Singh Ahluwalia (Ludhiana Distt :)
3. Dr. P. C. Taneja (Amritsar Distt :)
4. Dr. Kirpal Singh Vohra (Amritsar Distt :)
5. Dr. Bishamber Dass Behl (Gurgaon)

Auditors

1. Dr. Lakh Raj Chawala (Fazilka)
2. Dr. P. C. Bhandari

After this, the newly elected President Dr. Karnail Singh occupied the chair. He thanked the out-going office bearers. He made a move to form a Punjab Veterinary Association which should be represented by all the Veterinarians serving in the East Punjab, irrespective of the class of service. As all interests were not represented on this occasion, the matter was deferred till the next meeting.

After this the meeting was adjourned *sine die*.

S. D. SHARMA,
Hony. Gen. Secretary.
Punjab Subordinate Veterinary Service Association,
(Panipat).

Review

Handbook for the Etiology, Diagnosis and Control of Infectious Bovine Mastitis.—By IVAL ARTHUR MERCHANT, D.V.M., Ph.D, and R. ALLEN PACKER, D.V.M., Ph.D., Division of Veterinary Medicine, Iowa State College, Ames, Iowa, U.S.A. Price $ 2 00. Publishers:—Burgess Publishing Company, 426 South Sixth Street, Minneapolis 15, Minn.

Bovine Mastitis is of world-wide occurrence and its incidence is greater in countries with rich high-yielding milch cows. Naturally a good deal of literature has collected round this disease. Even then, there is a good deal of 'unsolved phases' of the disease especially on the predisposing factors in the causation of the disease. The authors of this handbook on Infectious Bovine

Mastitis are aware of this feature of this disease and they have given expression to it at the end of the chapter dealing with the Predisposing factors. In this and in the succeeding third chapter, practically all the various known factors about the predisposing and exciting causes have been very briefly and intelligently touched. The diagnosis of the disease is dealt in the fourth chapter and it is very correctly stated that 'there is no single test for Mastitis which will detect every case of the disease' and that 'a combination of physical, chemical and cultural tests will give the most accurate diagnosis'. In the fifth and sixth chapters, the control and treatment of disease has been briefly given with greater stress on the modern antibiotics like Penicillin, Terramycin, etc.

A good deal of information on this important and common disease of cows is packed in this Handbook and it can be recommended for ready reference to the practitioner and student alike.

ERRATA

In the article '**Studies on *Plasmodium Gallinaceum***' published in the *I.V.J.* Vol. XXIX., No. 1 (July 1952), the following corrections are to be made.

Page 17, para 4, line 6, for 'typs' read 'types.'
para 5, line 2, for 'of organ' read 'of the organ'.
Page 21, line 7, for 'but' read 'by'.
para 3, line, 3, for 'recorded' read 'recovered.'
Page 22 & 23, Column 6 for 'Paludrincrally dose 75 gms' read 'Paludrine orally dose 0.075 gms'.
Page 25, line 9, for 'phagocytosis' read 'phagocytic'.
,, para 2, line 3, for 'Gavrilovatel *et al*' read 'Gavrilov *et al*'.
,, ,, ,, line 6, for 'including' read 'inducing'.
,, para 3, line 1, for 'chicken' read 'chickens'.
Page 26, under references, please delete lines, 12, 13, 14.

In the article on '**Some Record on Normal Worm Burden of Fowls**', published in the same issue, make the following corrections.

Page 68, para 2, line 4, for '*Ascaridia gallii*' read '*Ascaridia galli*'.
,, ,, line 6, for '*Stronguloides avium*' read '*Strongyloides avium*.'
,, ,, line 7, for '*Aquaria hamalosa*' read '*Aquaria hamulosa*'.
,, opposite column, for '*Railletina echinobothrid*' read '*Raillietina echinobothrida*'.

* * *

We understand that Sri G. A. Shivnani of the Indian Veterinary Research Institute, Mukteswar, who was to have gone to America for higher studies, had to postpone his departure owing to delay in the receipt of his visa. [*Ed. I.V.J.*]

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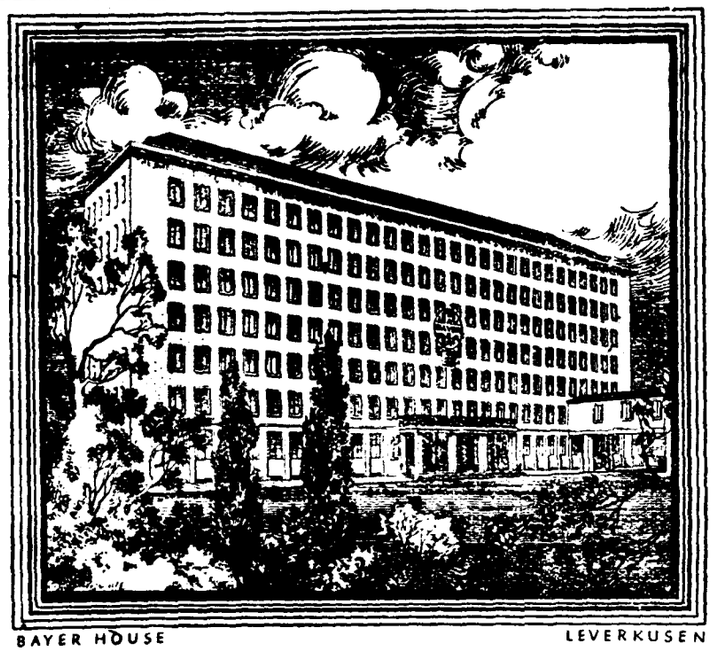

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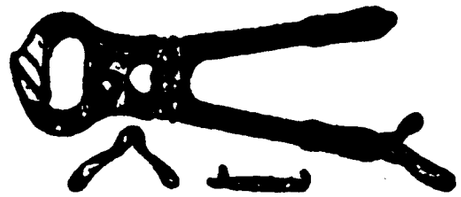

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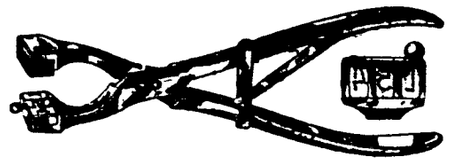

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