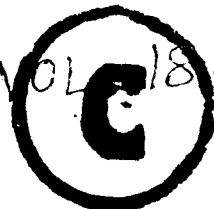


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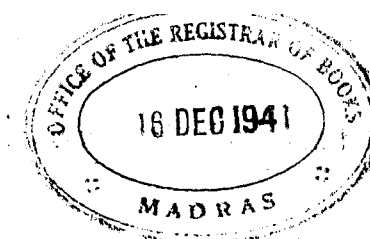
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R. J. Little, M. R. C. V. S., D. V. H.,
Municipal Veterinary Surgeon, Colombo, (Ceylon).

Mainly through whose efforts the Ceylon Veterinary Association was formed.



THE
Indian Veterinary Journal

Vol. XVIII

JULY 1941

No. 1

General Articles

CANINE NUTRITIONAL DEFICIENCY DISEASES*

BY

L. D. FREDERICK, D.V.M.,

AND

H. E. ROBINSON, Ph.D.,

Chicago, Ill.

THE ECONOMIC importance of the dog to-day surpasses the status of this animal at any time in the history of mankind. There has been a steady rise in the popularity of dogs since the World War, with a reported 1,800,000 dogs registered with the American Kennel Club and similar dog fancy organizations. This, of course, does not take into account the estimated 15 million crossbred and pedigreed dogs in the United States and Canada. One fourth, or 3,750,000, of them are the pedigreed and purebred but not registered class of dogs. Leon F. Whitney, D.V.M., in an article published recently in the American Kennel Gazette, stated that the farm-dog population is at least 7 million. In his estimation of the economic importance of dogs, as regards their food consumption, he stated that it requires 37,305,000 acres of land to produce their food. This area is equivalent to the acreage of the entire New England States, plus Pennsylvania, New Jersey, Delaware and Maryland. Whether or not this estimate is correct, we are not in a position to say, but we do know that with the increase in the dog population the demand for prepared foods has shown a decided increase.

From the Research Laboratory of Swift & Company.

*Journal of the A.V.M.A., April 1941.

According to investigators, a great many dogs require treatment for ills which are primarily of dietetic origin. There may be several reasons for such an opinion, prominent among them being:

(1) Increased care and attention being given the dog by the average owner.

(2) The greatest percentage increase in dog ownership has occurred in metropolitan districts where the animal leads a restricted life, both from a standpoint of exercise and diet.

(3) A majority of the brands of canned dog foods claim to have a completely balanced diet, a statement which is open to doubt in a large number of cases. Dogs fed exclusively on an inferior product are almost certain to become ill with many symptoms of deficiency.

As to the volume of prepared dog foods, we can state that the sale of canned and dried dog foods has either followed or led this increased desire for dogs in the home. There are at present approximately 600 brands of dog food offered for retail sale, prepared by over 250 manufacturers. The 1939 total volume was, in round figures, 600 million lb. The volume of the canned product was second only to milk, which ranks first.

We are well aware that there are on the market a number of canned dog foods, as well as dry ones, which are the result of honest, scientific efforts to make a nutritionally adequate and wholesome product. Unfortunately, we also know some brands are being marketed that are of inferior nutritive quality. The dog and its nutritive requirements, the expectancy of the owner to obtain full value for his money, and the hope of the veterinarian that he can recommend a dog food to his clients with confidence, are all points which should be given due consideration by manufacturers. It would seem of paramount importance, therefore, that some accurate, fast and economical method be devised to appraise the nutritive value of all dog foods.

Dietary Requirements.

Most of the information available on the dietary requirements of the dog has been compiled from a large number of experiments in which the dog was merely a test animal. Unfortunately, there have been relatively few studies made on the requirements of the dog itself. Prominent among the investigators who have used the dog as an experimental animal and from whose work we may draw conclusions are Ivy of the North-western University Medical School; Cowgill of Yale; Steenbock and associates of Wisconsin; Elvehjem and co-workers of Wisconsin; Mellanby of England; and Schlotthauer of The Mayo Foundation, to mention only a few. Discussing the various nutrients individually we mention the following:

(1) *Protein*.—The nutritive value of any protein material is dependent directly upon the amino acids it can supply. There are ten or more essential amino acids which must be present in the dog's diet to permit proper growth (muscular, glandular, general tissue, and hormone formation; and replacement). In general, the proteins of animal origin are far superior to those found in cereals or vegetables. Mixtures of proteins from vegetable and cereal sources are appreciably improved by the addition of meat proteins. In general, one may say that dog foods containing 10 per cent of protein, which is primarily of animal origin (usually not less than 75 per cent of animal origin), will give excellent growth, provided the other essential nutrients are present. It has been found by biological experimentation that those dog foods containing less than 10 per cent of protein are liable to be deficient.

From the above statement on the place of proteins in the diet, we feel that it would be presumptuous to point out the deficiencies that can arise from the use of a diet which is low in proteins of high biological value. We deem it appropriate, however, to call attention to the work of Agnes Fay Morgan of California and Elvehjem and coworkers of Wisconsin, who have held that fright disease was due to a deficiency of one of the essential amino acids, lysine. Elvehjem *et al* reported before the American Chemical Society meeting at Detroit, in September 1940, that on tests they had run on baked dry dog foods nervous and paralytic symptoms of the test animals had developed as well as an unsatisfactory growth. This they attributed primarily to a deficiency of lysine, which is not heat-stable in dough mixtures.

(2) *Fat and Carbohydrates*.—That dogs are able to almost completely digest starch has been demonstrated by Ivy of the North-western University Medical School. The main objection to canine rations high in carbohydrates is that this substance displaces proteins, minerals and vitamins and thus acts to decrease the percentage of these factors in the diet. It is probably safe to say that a nutritive ratio of two parts of carbohydrates and fat to one part of protein should be the maximum limit in a dog's ration. The requirement or tolerance for fat will depend a great deal, of course, upon the energy requirement of the individual animal. It has been suggested that a range of a maximum of 5 per cent and a minimum of 2 per cent fat in a canned dog food is probably best suited for all types of dogs. The nutritive value of proteins, carbohydrates and fat is not appreciably impaired by canning processes.

(3) *Energy Requirements*.—The deficiencies due to an inadequacy of carbohydrates and fat are readily apparent from the following discussion of their function and requirements. During the periods of puppy growth,

pregnancy and lactation, dogs require more than the maintenance allowance of food. It has been indicated that puppies may require about twice the predicated maintenance levels on caloric intake for adult animals. The accepted standard on caloric requirements for a dog from a maintenance stand-point, as determined by Cowgill has been 70 to 80 calories per kilogram of body weight per day. This means approximately 30 to 40 calories per pound per day, varying widely according to the stage of development, weight and working conditions.

If a dog food meets the minimum standard of 10 per cent protein, 2 per cent fat and a nutritive ration not greater than 2 to 1, the range of canned food intake per dog per day will be about from 1 lb. for a 15-lb. dog to 2½ lb. for a 50-lb. dog, with increased food intakes for unusual functions. It must be remembered that the most satisfactory way of supplying elements for the maintenance of body heat and supplying energy is by the supplying of an adequate amount of carbohydrate and fat, and not by the wasteful and excessive use of proteins.

(4) *Minerals*:—The requirements of dogs for the mineral elements have not been sufficiently studied to permit accurate estimations. Some idea of



Fig. 1. Avitaminosis A. Advanced stage of ophthalmia in a dog kept on a vitamin A-deficient diet for 84 days. Almost complete collapse made it necessary to support the head for this picture.

(Photo courtesy American Journal of Physiology and of A.V.M.A.)

the requirements may be obtained of course, from general figures for other animals' requirements. Calcium and phosphorus, which are so essential both

in amount and in balance to the formation of strong bones and sound teeth, are completely available to the dog when supplied as bone ash or ground bone. Most rickets in the dog has been found to be of the type caused by a combination of vitamin and mineral-deficiency factors. This constitutes another argument for a relatively high meat content in dog foods, since these products are rich sources of essential minerals and vitamins. This does not, however, mean that mineral supplementation as well as vitamin supplementation to most dog diets is not necessary. Other essential minerals such as iron, copper, iodine, magnesium and sulphur, are ordinarily considered to be furnished in adequate amounts by the natural plant and animal products which are used in the better classes of prepared dog foods and home-prepared diets. Common salt will, of course, supply the necessary sodium and chlorine. Additional information relative to mineral and deficiency diseases will be given in a later paragraph in this paper in the discussion of vitamin D.

5. *Vitamins*.—The vitamin requirements of the dog have been studied in detail by Cowgill of Yale, who used this animal in his original work on vitamin B₁. Other investigators have used the dog for studies on vitamin D in relation to the deficiency disease, rickets, and vitamin A in relation to muscular weakness and the eye deficiency disease of xerophthalmia. The vitamin C requirement of the dog has been closely studied and it has been found that this animal is able to synthesize the vitamin.

It might be well to state here that the question of vitamins is not related to the individual vitamin materials but, rather, to the function of all of these materials in proper balance and combination. A deficiency of one vitamin may cause an improper metabolic use of all the other vitamins which are known to be essential. Such a statement is, of course, true of any balanced diet. There are always certain limits above the minimum requirements which will not upset the balance of a ration, but should any one of the essential nutrients, including minerals and vitamins, be out of balance from the standpoint of deficiency, there will be a corresponding unfavourable reaction from all the other food materials.

Tremendous strides are being made daily in the isolation and identification of the many vitamins concerned in human and animal nutrition. One of the most important recent findings is the identification of the canine anti-blacktongue and human anti-pellagra vitamin. This has been found to be a relatively simple chemical compound—nicotinic acid. The discovery was made by Elvehjem and co-workers of the University of Wisconsin. Sebrell of the U. S. Public Health Service, Cowgill of Yale and several others have verified the findings that nicotinic acid is the specific material concerned in the prevention and cure of canine black-tongue.

Concerning all nutritional research to the present time, we may outline the known vitamins and their functions in canine metabolism together with



Fig. 2. Same subject as in figure 1 after having been treated for ten days with 20 cc. of cod liver oil per day. Note almost complete disappearance of the ophthalmia.

(Photo courtesy American Journal of Physiology and of A.V.M.A.)

a description of them, including their deficiency symptoms, and other pertinent information as follows:

Vitamin A

Generally recognized chemical formula $C_{20}H_{30}O$. Commonly designated as the antixerophthalmic vitamin. No chemical name has yet been officially adopted.

Description.—Soluble in oils, not in water, not affected by heat in cooking or drying, but inactivated by oxygen at higher temperature.

Functions.—Promotes growth, appetite and digestion. Essential for normal reproduction, lactation and rearing of the young. Protects against xerophthalmia, night blindness and against infections of the respiratory tract. Estimated requirement for dogs: 70 to 80 international units per kilogram of body weight per day.

Deficiency Symptoms.—(a) Incipient stage. Lowered resistance to infections, inflammation of intestines and slight inflammation of the upper respiratory passages, Retarded growth or loss of weight.

(b) Advanced stage. Impaired vision, particularly night blindness. Inflammation of the conjunctiva even advancing to ulceration of the cornea. Injury to mucous linings of the body.

CANINE NUTRITIONAL DEFICIENCY DISEASES

Sources.—Fish liver oils, liver, green vegetables, kidneys, butter, hearts, tomatoes, carrots, cheese, eggs and milk.

Vitamin B₁

Generally recognized chemical formula $C_{12}H_{18}N_4OSCl_2$. Usually termed the anti-neuritic vitamin. Chemical name in the pure state, thiamin chloride.



Fig. 3. Vitamin B₁ deficiency showing extensive polyneuritis. The leg muscles were contracted, especially those of the posterior extremities resulting to extension of all limbs and inability to stand. When this dog was handled, severe clonic spasms resulted.

(Photo courtesy American Journal of Physiology and of A.V.M.A.)

Description.—Soluble in water and not in oils. Partially destroyed by heat particularly in the presence of alkali and oxygen. It is available synthetically.

Functions.—Promotes growth, appetite, carbohydrate utilization and digestion. Protects against the nerve disease, polyneuritis. Required for normal reproduction and lactation. Estimated canine requirement 3 to 4 international units per pound of body weight per day for mature dogs, and up to three times this amount for the period of rapid growth.

Deficiency Symptoms.—(a) Incipient stage. Poor growth of young during lactation, decreased fertility, inappetence and retarded growth or loss of weight.

(b) Advanced stage. Polyneuritis characterized by paralysis and nerve degeneration, cardiac weakness and edema. Patton has reported that fright disease of dog due to a deficiency of this vitamin. This report is questioned by several investigators because they have not been able to reproduce his findings as reported.

Sources.—In the pure state as thiamin chloride. Also from rice polish, dried yeast, liver, lean pork, wheat germ, milk, beef, eggs, carrots, tomatoes, whole wheat and citrus juices.

Riboflavin

The generally recognized chemical formula is $C_{17}H_{20}M_4O_6$.

Description.—Soluble in oils, stable to heat.

Fig. 4. Same subject as in figure 3, 18 hours after the administration of neutralized tomato juice. Spasticity of the muscles and spasmodic condition almost gone.

(Photo courtesy American Journal of Physiology and of A.V.M.A.)



Functions.—Essential for growth and in maintaining a healthy condition of the skin. Estimated canine quantitative requirement 25 micrograms per kilogram of body weight per day.



Fig. 5. Vitamin D-deficiency. This dog grew from puppyhood on a vitamin D-deficient diet which resulted in this extreme case of rickets.

(Photo courtesy American Journal of Physiology and of A.V.M.A.)

Deficiency Symptoms.—(a) Incipient stage. Inconstant dermatitis consisting of erythema followed by dry, flaky exfoliation. In males the scrotum has been involved otherwise most common on the chest, abdomen, insides of the thighs and axillae.

(b) Advanced stage. Bradycardia and an exaggerated sinus type of cardiac arrhythmia. Premature aging. In the final stages, the respiration is slow and irregular, finally terminating in collapse, coma and death. Necropsy findings center around a yellow mottling of the liver with a high fat content.

Sources.—Concentrates from liver, yeast and whey. Also from kidneys, liver, milk, lean beef, eggs, greens, soya flour, various fruits and vegetables.

Nicotinic Acid

The usual quoted chemical formula is $C_6H_5NO_2$. The accepted descriptive name is anti-black tongue or anti-pellagra vitamin.

Description.—Soluble in water, stable to heat.

Functions.—Necessary for the prevention or cure of canine blacktongue. Estimated dog requirement as protective for blacktongue 0.2 mg. per kilogram of body weight per day and curative 0.5 mg. per kilogram of body weight per day. Administered either orally or intramuscularly. Nicotinic acid amide is reported to have the same effect.

Deficiency Symptoms.—(a) Incipient stage. Poor appetite, progressive weight loss.

(b) Advanced stage. Vermillion bands on lips, general reddening of the oral mucosa and occasionally persistent diarrhoea. This is particularly true in the marked

deficiencies as well as the well-known extensive lesions of all oral tissue accompanied by a characteristic fetid odor.

Sources. In the pure state as nicotinic acid. Also from liver, yeast, meat, wheat-germ, tomatoes, beans, eggs, milk and soya flour.

Vitamin B₆

This has been termed by some investigators as pyridoxine. It is one of the newest members of the B. complex and was isolated in 1938 and synthesized for the first time in 1939 by Folkers and Harris of the Merck Research Laboratory.

Unna, in his paper prepared for the A.V.M.A. meeting in Memphis, 1939, stated: "Vitamin B₆ is needed by rats and dogs for normal growth and development and there is a strong indication that it is also required by the pig and man. White rats on a diet complete in vitamin B₁, nicotinic acid and riboflavin (and other factors recognized as the B complex) but deficient in B₆, cease to gain weight after three to six weeks and develop characteristic skin lesions of so-called rat acrodynia. The paws become swollen, edematous and denuded. Ulcers frequently develop around the snout and on the tongue. The ears thicken and become scaly. The animals lose weight and die within one to three weeks after symptoms develop. Administration of vitamin B₆ relieves the symptoms promptly and the rats gain weight. Natural food sources of this vitamin are liver, yeast and rice bran."

Vitamin C

The usually recognized formula is $C_6H_8O_7$. It has been designated as the anti-scorbutic vitamin. Chemical name is ascorbic acid.



Fig. 6. Vitamin D-deficiency. The jaw bone shown in the upper picture was taken from a dog raised from puppyhood on a vitamin D-deficient diet. The jaw bone shown in the lower picture is normal, the dog from which it was taken having always had an adequacy of vitamin D.

(Photo courtesy American Journal of Physiology and of A.V.M.A.)

Description. Water soluble. Destroyed by oxidation at high temperatures.

Functions. Essential for normal bone and tooth formation. It is necessary in the oxidation processes of the cells. The normal dog can synthesize vitamin C.

Vitamin D

Commonly termed the anti-rachitic or "sunshine" vitamin. The usually recognized chemical formula is $C_{27}H_{44}O$. No chemical name has been adopted, officially,

nor has this vitamin yet been synthesized. Quite a few workers prefer to split this vitamin up into several divisions, giving them numbers as vitamin D₁, D₂, etc.

Description. Soluble in oil; stable to heat and oxidation. Occurs in several forms.

Functions.—Regulates the absorption and metabolism of calcium and phosphorus for the bones and teeth. Prevents rickets. Canine requirement is the subject of considerable controversy. It has quite generally been stated that 1.5 to 2 international units per kilogram of body weight per day per mature dogs and 20 to 25 international units per kilogram of body weight per day for the period of rapid growth was adequate, but a great deal of research tends to cast suspicion on these figures. The smaller dogs, particularly terriers of all kinds and some of the spaniels, may require far less vitamin D for normal bone calcification than do some larger breeds. Some of the larger breeds, especially the Danes, may require many times that of the smaller breed on a kilogram per body weight basis. The vitamin D requirement varies quite widely with the amount and ratio of calcium and phosphorus in the diet and conditions under which the pup is raised as well as the breed.

Deficiency symptoms.—(a) Incipient stage. Increased tendency for dental caries. Lowered resistance.

(b) Advanced stage. Rickets and Osteomalacia.

Sources.—Sunshine, fish liver oils, irradiated ergosterol, and egg yolks.

Vitamin E

The usual designated chemical formula is C₂₀H₅₀O₂. It is termed the anti-sterility vitamin. Sometimes called by the chemical name of tocopherol.

Description.—Oil soluble, extremely stable, Inactivated by oxidation.

Functions.—The ordinary balanced ration apparently carries enough vitamin E for normal reproductive processes in the dog. The quantitative canine requirement is not known.

It has been reported by some workers that a deficiency of this vitamin in a dog has been responsible for abortion in the female and also resorption of the fetus. Loss of fertilizing power and libido in the male have also been attributed to a deficiency of the vitamin. The work we have reviewed does not appear to be conclusive in this respect.

Sources.—Wheat germ oil and wheat germ meal. Whole grain cereals and vegetable and corn oils.

Other Vitamins

There are several other factors which are recognized as being vitamins but whose functions are not yet established to the point of practical interest. Among these may be mentioned pantothenic acid, which Elvehjem and coworkers claim to have definitely shown to be required by newly weaned puppies and older growing dogs for normal growth. They report that the complicated nature of pantothenic acid deficiency, such as they have observed thus far, reduces the significance of the variety of symptoms which they have seen. Irregular cardiac activity in tachycardia, less frequency in

bradycardia, nausea and vomiting, intussusception and finally loss of fur and dry scaliness of the skin suggest an impairment of autonomic control and especially that of the parasympathetic nervous system. What factor or factors these symptoms are attributable to cannot be seen in the light of present evidence. Then, too, there is a factor W, the gray hair factor, B₆, B₁₂, the anti-hemorrhagic vitamin K and possibly others that we might consume your time in discussing; but in as much as the function of these factors in canine nutrition and the requirements for them are not known, we merely list them at this time.

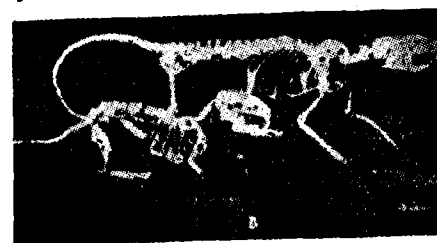


Fig. 7. Calcium and phosphorus inadequacy and improper balance in the rat. A and B are twin brothers. Rat A was raised on a diet adequate in all minerals and in proper balance. Rat B was raised on a diet inadequate in calcium and phosphorus and the balance was incorrect.

Photo courtesy H. C. Sherman, A.V.M.A.

Conclusions

In any consideration of the vitamin requirements and functions for dogs, it must be borne in mind that a deficiency of any one factor has a direct bearing on the functions of many of the other vitamins. A well-balanced ration of natural food products containing adequate amounts of all the known vitamins supplemented with quality oils for vitamin A and D fortification is the most satisfactory method of deficiency prevention. There may be cases in which an impaired absorption in the animal organism can cause vitamin deficiency diseases on ordinary adequate diets. In cases of this kind, or in those in which an immediate response is essential, it is quite possible to take recourse to injection and oral feeding of the several pure vitamins now available.

SOME DISEASES OF THE EAR OF DOGS *

H. C. STEPHENSON, B.S., D.V.M.,

Ithaca, N. Y.

This Discussion will be confined principally to diseases or conditions external to the ear drum.

Otorrhea is one of the terms used to designate an inflammation of the ear. Clinically we recognize three or four types of otorrhea of the external ear. They are the catarrhal, the parasitic, the chronic indurative and that type, otorrhea cerumenosa, which is due to excess formation of wax. Any one of these types may blend into another. A case of parasitic otorrhea may progress to catarrhal otorrhea with ulcers of the cartilage and even inflammation of the middle and inner ear. In addition to those conditions we are confronted with wounds, tumours of the lining of the external ear, haematomes of the external ear flap and various skin diseases, such as ring-worm and the manges.

Parasitic Otorrhea

Parasitic otorrhea is an inflammation of the lining of the external ear due to the presence and activity of a mange mite. The disease has been called choriopic otacariasis, auricular scabies, parasitic otitis, epileptiform disease of sporting dogs, and canker. The parasite causing the trouble has had a number of names, among them *Sarcoptes ecaudatus*, *Symbiotes auricularis*, *Choriptes auricularis*, *Dermatophagus auricularis* and *Otodectes cynotis*. It does not burrow in the skin as does the sarcoptic mite, but supposedly pierces the skin to suck lymph and so produces an inflammation (Monnig). The irritation produced is probably mechanical from the moving about of the parasites, although a certain amount of infection of the ear lining usually accompanies this condition.

Symptoms.—Intense itching is the most prominent symptom. It results in scratching of the ear with the feet, rubbing the ear on the floor or ground and frequently quite vigorous shaking of the head. The shaking of the head often becomes violent and is especially noticeable when the dog starts to move about after being at rest for some time. Manipulation of the ear also induces shaking.

The itching induced by this parasite may bring an epileptiform convulsions, especially in the young. This fact has been impressed upon us so

* From the New York State Veterinary College at Cornell University; presented before the Section on Small Animals at the 77th Annual Meeting of the A.V.M.A., Washington, D.C., August 26—30, 1940. Journal of A.V.M.A., Feb. 1941.

frequently that we always examine the ear of dogs and cats that are presented to us because of convulsions. The vigorous shaking many times results in hematoma of the ear flap or in sores on the end of the ear. These sores on the end of the ear are practically impossible to heal if parasitic otorrhea exists and it cannot be controlled. The most important part of the treatment of these sores is the removal of the cause of the shaking.

Diagnosis.—We make the diagnosis of parasitic otorrhea if we find the parasite. Failing to find the parasite, we also make this diagnosis if we find a chocolate-brown, waxy discharge. Other conditions may cause severe itching, but the chocolate-brown, waxy discharge is typical of parasitic otorrhea. The *Otodectes* parasites are rather large for mange mites, being visible to the naked eye in many cases. A small hand lens may be helpful in finding the mites in the discharges removed from the ears. A simple procedure is to place the discharges on a piece of paper in sunlight or in a warm place. The heat soon causes enough activity on the part of the parasites that movement can be noticed with the naked eye. Within a short time, if parasites are present, they may be seen crawling around on the paper.

Under the microscope, this parasite can be differentiated from the sarcoptic mite by its legs, which are much longer and extend beyond the abdomen. Mixing some of the chocolate-brown, waxy discharge with a little mineral oil on a glass slide may help one to discover the parasite under the microscope, using low-power magnification.

Treatment.—Treatment consists of the destruction and removal of the parasites and the alleviation of the irritation produced by their presence. Cleaning of the ear removes the greater portion of the parasites and paves the way for the destruction of the young mites as they hatch out. The therapeutic problem presented by this condition calls for the use of an antiseptic, an anaesthetic and parasiticide. We not only have the problem of ridding the ear of the parasites present, but also the one of preventing a new crop from developing. We know that the many folds inside the ear hamper positive and complete cleaning. Our practice is to clean the ear and apply our treatment daily for four or five days. Then the ear is treated every three or four days for three weeks. The applications toward the end of treatment will be more of a protective nature than parasitic, such as zinc oxide ointment or petrolatum.

Our treatment the first few days destroys and removes the parasites. Our later bland treatment protects and soothes the skin lining of the ear and also from time to time removes eggs and newly hatched parasites. In many cases prompt relief follows the first three or four days' treatment, but there is a recurrence in a month or six weeks if treatment is not continued.

We do not know the length of time required for the hatching of the eggs. Monnig believes the life cycle may be similar to that of the Psoroptes, which would be about nine days from egg to adult. However, if treatment is continued occasionally for three weeks after the relief of symptoms, there is not likely to be a recurrence. Of course, complete cure can be followed by reinfestation.

Many different preparations have been employed in the treatment of parasitic otorrhea. Herms lists sulfur ointment, 10 per cent tincture of iodine in glycerin, and 1 per cent phenol in linseed oil. Hall uses eight parts of carbon tetrachloride in three parts of castor oil. Berge has used 3 per cent phenol in olive oil, and the following mixture: one part each of betanaphthol and ether in 20 parts of petrolatum; to this add 1 per cent phenol, 0.5 per cent cresol and 5 per cent salicylic acid. Brumley uses liquid petrolatum alone or with 5 per cent phenol added. Hutya and Marek list 10 per cent oil of caraway in olive oil; equal parts of balsam peru and glycerin; also naphthol ten parts, ether 30 parts and olive oil 100 parts. We use one part of mercuric nitrate (citrine) ointment melted at a low heat and added to three parts of warm neatsfoot oil. We also use a 1:1,000 solution of mercuric bichloride in 70 per cent alcohol. Another mixture we use contains 20 parts of phenol, 40 parts of camphor and 40 parts of liquid petrolatum, especially in those cases where itching is intense.

The above list of preparations used in this condition is by no means complete. Each clinician seems to have his own particular parasiticide mixture that he has developed for the treatment of this disease. We have used a number of the above or similar ones and believe them all to be of value. However, we think that thorough cleaning of the ear of all wax and discharges is probably the most important part of any treatment for this condition.

Tumified Ear or Hematome of the Ear Flap

One of the sequels of otodectic mange is hematome of the ear flap or tumified ear. Rarely is a hematome of the ear flap caused by anything other than the dog shaking its head and breaking a blood vessel in the ear flap. If seen early, the enlargement is usually found near the tip of the ear. After a few hours or days the whole external ear may be involved. It has been our contention for years that the hematome occurred between two layers of cartilage. A recent histological study of the cartilage of the concha seems to indicate that there is only the layer of cartilage. If such proves to be the case, then we will have to consider that the hemorrhage occurs between the lining skin of the ear and the cartilage.

Treatment.— Our treatment has been to incise the hematome on the inner surface of the ear, to clean out all shreds of fibrin and to quilt the medial and lateral surfaces of the hematome together. We do this under as nearly aseptic conditions as possible. To protect the ear afterward, we pad both ear flaps with cotton, lay them back over the head and apply a night cap, or many-tailed bandage, to hold them in place. By so doing, we hope to prevent further shaking of the head and also the entrance of infection. If infection can be prevented there is a fair chance that the ear flap will heal without crinkling.

We have tried daily aspiration of the fluid in a few cases. This has not always been successful because of seepage of serum into the hematome cavity. In one case we were successful in using aspiration because we were able to insert a cotton plug into the ear canal and bind the flap around this plug so that some pressure was applied to the ear. This seemed to hold the inner surfaces of the hematome in contact so that they healed together. In one case, after draining a small hematome of the ear, we held the surfaces together by applying a paper clip. The next time we tried it, the pressure apparently was too great because there was scar formation at the point of contact of the clip and also permanent loss of hair. In another case a German Shepherd, the dog was able to shake his ear out from under the night cap. To protect the ear during the healing process, after quilting we bound the ear around a plug of gauze and then slipped a length of small size stockingette over the ear and tied the base of this tube around the head. In this case the ear stuck out straight from the head with the result that there was less effort on the part of the dog to rid himself of the bandage.

In the case of hematome of the ear in cats, Dr. Milks and the writer have been quilting the ear through holes in two metal plates. By so doing, we have obtained fairly even pressure. We also have been able to shape the plates so that the ear flap healed more nearly in its original shape. The plates were made by cutting thin sheets of aluminium, obtained from an aluminium sauce pan, to the size and shape required. Numerous holes were bored through sheets to reduce weight and to allow for suturing through and through.

Before leaving the subject of hematome of the ear flap, we would like to say that we do not recall a case in which there was not some irritation in the ear canal. In most cases it could be demonstrated that parasitic otorrhea existed. If treatment of the hematome is not accompanied by treatment of any irritation of the lining of the ear, recurrence is quite liable to follow.

Catarrhal Otorrhea

Catarrhal otorrhea is similar to the moist eczemas of the skin that are found on other parts of the body. In this condition there is a continual discharge of purulent material from the ear. The infection present may be the result of a parasitic otorrhea, the accumulation of dirt, the presence of foreign bodies, the breaking down of tumours, distemper and excess moisture.

Symptoms.—If only one ear is affected, the dog usually holds the head sideways with the diseased ear down. There is some itching. The condition is painful and, because of this, scratching, shaking and rubbing of the ear are done carefully. Manipulations of the ear results in pain and also gives a "squashy" sound. In a beginning case the exudate from the ear is thin; later it becomes thick, yellowish, purulent and sometimes streaked with blood. The parts of the ear which come in contact with the discharges are inflamed and quite tender. After this condition has existed for some time, there may be ulceration of the lining of the ear and exposure of cartilage.

Treatment.—Before the application of any particular drug is tried, the discharges, must be removed as completely as possible. This can be done either with dry pledgets of cotton or by washing with various solutions. The solutions most commonly used are soap and water, ether, boric acid solution and chlorine solution. The ear should be dried after cleaning. The use of an otoscope at this point will be a great aid in determining the extent of damage done to the lining of the external ear.

Medication may be antiseptic, astringent or absorptive and drying, or a combination of all three. Occasionally it is necessary to apply a local anaesthetic. We have used butesin-picrate ointment, butyn solutions, 5 per cent phenol in glycerin and campho-phenique for this purpose. Of the antiseptic solutions the following are frequently used and found valuable in controlling the infection: 1 per cent chloramine; alcoholic and aqueous solution of tannic acid, freshly prepared, and also 5 per cent each of tannic and salicylic acids in alcohol. In beginning cases we believe we have more rapid results when we apply a 5 per cent aqueous solution of silver nitrate to the lining of the ear. Practically all dusting powders are of value in this connection as they tend to dry up the excess secretions. The application of a mild ointment, such as zinc oxide ointment, is of considerable value in protecting those parts not already affected.

No two cases of catarrhal otorrhea can be treated exactly alike. The form of treatment that seems best in one case may prove a failure in the next. The general principle of using astringent or drying drugs should be

adhered to, but frequently the treatment used must be changed a number of times during the handling of a particular case.

If ulceration of the lining of the ear has occurred with exposure of cartilage, the case will be more difficult to treat. We not only have the job of controlling the infection, but also of encouraging the healing of skin over the denuded cartilage. In many cases the condition has lasted long enough to bring about narrowing of the canal to the point where the application of drugs is nearly impossible. In many of these old cases our only chance of bringing about relief is to resort to slitting of the cartilage so as to expose the canal. We were rather hesitant to do this in our first cases because we thought there might be too much disfiguration. We now feel that when the lining of the ear is so thickened that we cannot properly treat it, we will save many such cases by resorting to this operation. We not only provide drainage, but also expose the parts so that treatment is much easier.

We slit the ear on the outside with a knife, scissors or the electro-surgical needle down as far as the right angle turn toward the ear drum. We used to take out a v-shaped piece of the cartilage, but no longer find this necessary. We sew the external skin to the internal skin lining of the ear. We sew from the inside outward as that seems to allow us to get a better hold for our suture in the skin lining the ear; at least, we can insert our needle better in that manner. Sometimes the bottom of the slit gives us a little trouble in sewing. An occasional case is so badly infected that our suture line becomes infected also, and the stitches break loose. Of course, this results in delayed healing of the incision, but we have to risk such an occurrence. After the lining is exposed, we can treat the exposed ulcers much more readily than before. Drainage is greatly improved. Even if we are not able to bring about healing, after slitting the ear canal in these chronic cases, we do accomplish something. The dog is much more comfortable than before. The relief from pain is well worth the effort in many cases. The scar is not very noticeable even in prick-eared dogs.

Otorrhea Cerumenosa

Otorrhea cerumenosa is characterized by an excess of cerumen or wax formation in the ear canal. The symptoms are itching and the presence of an excess of wax. The wax may range in color from grey to yellow to brown. The wax in the dog's ear is rarely found to be as firm as that in the ear of man. The wax may range in consistency from soft to pasty, and even sometimes semi-fluid. If there is decomposition of the wax, the odour will be fetid. As far as we can tell, the cerum or wax glands are distributed throughout the whole lining of the ear canal. A great deal of itching accompanies an excess production of wax. In some cases the lining of the ear

will be thickened and erythematous. Many cases do not recover rapidly and the condition may last for years with intermittent periods of relief.

Treatment.— Treatment consists of cleaning the ear and applying those drugs which seem to have a tendency to lessen secretion from the skin. These are salicylic acid, resorcinol and tannic acid. If salicylic acid is used either in solution or in ointment, the percentage should be kept low, as the skin lining of the ear is more susceptible to damage from salicylic acid than the skin of other parts of the body. We have found an alcoholic solution of 1½ per cent salicylic acid and 5 per cent glycerin to be useful in controlling this condition. In our most recent cases we wiped over a tablespoonful of soft, grayish wax from one ear. The lining was slightly thickened and reddened. We applied zinc oxide ointment. The erythema subsided as did the production of wax. The dog feels much better, but will probably be brought back to us again, as he was last fall, and also last spring.

Comment

Before closing, I would like to stress two points. First, no one standard treatment will suffice for all cases of otorrhea; treatment should be based on what we see in the course of our examination. Second, over-treatment will delay healing nearly to as great an extent as undertreatment. Protective bland applications are valuable.

Journal of the A. V. M. A., February 1941.

CARE OF HORNS *

BY

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Horns of cattle are the chief organs of defence for them. They vary in size and shape, in different classes of animals. The horns of buffalo class of animals, are rather flattened and mostly long. The shapes of horns of bullocks are generally upwards and forwards but upwards and backwards are also found. The shape of buffalo horns are mostly outwards and backwards and therefore the buffalo takes an awkward position of the head while in yoke. The round horns of cattle are more hollow than the flat horns of buffalo. Buffalo horns therefore fetch better price. The shorter

* Paper read at the Annual Conference of the Bombay Veterinary Medical Association, held at Dharwar, in December 1940.

the horn, the less it is hollow. The horns of country-bred bullocks are not long and therefore they are less hollow. The horns of Krishna Valley bullocks are thick and short and therefore they are less hollow. The horns of "Khilari" and Moodal—Amritmahal—Mysore breeds of cattle are long and therefore they are more hollow. This is the general condition of the horns but there may be a few exceptions. There is one more condition of the horn, which is called in Kanarese as "Togal-kodu" which means "Skin horn." This condition of the horn is shaky at the root but is normal.

Diseases of horns as met with in practice, are few. They are, cancer horn and fracture horn. Only fracture horn is treated here. Fracture horn is due to two conditions. Firstly it may be due purely to direct accident when the horn is in normal condition. There is another condition which may be styled as "artificial". In this condition the horny-core is pared deep, as to reach the fleshy part and cause a wound and a hole in the horny-core. There are instances where the slightest concussion of the horn has caused fracture on account of weakening of the horny-core, due to deep paring which normally would not have caused fracture.

Paring of the horn, like docking of the tail of dog, is resorted to, as a hobby, to improve the outlook of bullocks. Paring of the tip of the horn to fit brass caps, is a harmless operation. But paring of the superficial layer of the horny-core of the horn, is undertaken to have the horns appear well polished. This is essentially done in case of Khilkar and Mysore breeds of bullocks. Generally cattle dealers do it to get better price. They, after paring smear the whole horn with some paint or oil to have shining appearance. Cultivators too resort to paring of the horny-core. This operation is done generally by the farrier who keeps a paring knife. I have seen individual owners also undertake this operation. In some cases, instead of paring the superficial layer of the horny-core with the idea of levelling the surface, they go so deep as to cause fracture of the horn and wounding of the fleshy part of the horns. There are instances where both the horns are affected in this way.

During the past six months, 25 cases were treated in Ron Veterinary Dispensary for the diseases of horn. Out of 25 cases, 8 were cancer horn cases and 17 were fracture horn cases. Of the 17 fracture-horn cases, 4 were purely due to accidents in normal state and the remaining 13 cases were due to direct or indirect results of paring.

The thickness of the horny-core of an average horn of 18 inches long is about ½ inch at the centre with slightly increased thickness at the base. The tip of the horn is solid about 3 inches.

Paring of the horny-core is a bad practice which exposes the horn to easy accidents. It is the duty of every veterinarian to advise the cultivators

on this matter. They should be advised not to purchase the bullocks whose horns have been pared, as they are liable to easy accidents. They should also be advised not to undertake paring as they are ignorant of the thickness of the horny-core and the bad consequences afterwards. Epistaxis is likely to be caused when the horny-core so pared gets heated in summer.

In my observation it is seen that there are more cancer horn cases in bullocks than in cows or buffaloes. This makes one to suspect that the infection of cancer is carried probably through the weakened horny-core due to paring.

The cultivator pays high price for good such bullocks, pares the horny-core to have a better look but the consequences are bad as described above and he becomes very much dejected and is put to a great loss. This is therefore a warning to him regarding the paring of the horn.

"MAL-PRACTICE OF PHOOKA AND ITS CONSEQUENCES."

BY

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History

At the Sakarabai Dinshaw Petit (Animal) Hospital, I happened to come across a case of phooka in a cow the history of which ran as follows:

The Chief Veterinary Inspector attached to the Society of Prevention of Cruelty to Animals, Bombay, prosecuted the owner of a cow under the Phooka Act and brought the animal to the hospital for examination. The examination revealed that there was congestion of the mucous-lining of labia vaginalis and by gentle manipulation of the affected part, the animal used to urinate. A certificate was granted to the effect and the man was convicted by the court.

Observations.

During the stay of the cow in the hospital for about a month, I observed that the animal was very much ill-tempered and nervous; she was quite unmanageable at the time of admission. As days passed on, the animal

used to be violent at the sight of a man. I considered over the point and could not come to a conclusion whether this "change of habit" would amount to vice or accidental change of temper. This question was further discussed with the Principal, Mr. Mohey-Deen and he was of opinion that it might be due to the insertion of a powder. I was at a loss to know whether the owner practised such a thing to make the animal frightened and nervous and thus to yield more milk or whether he did it because the cow was mischievous and unmanageable.

Previous history of the cow showed that daily insertion of powder into vagina before milking made the animal nervous, obstinate and uncontrollable by strangers, though she could be controlled by the owner.

Kindness, coaxing and patting the animal gently at the time of milking showed an improvement in her behaviour but the quantity of milk was diminishing gradually. Generally, "graded cows" from milk-yield point of view are good milkers and this cow might not be an exception to that; but the greediness of the owner to obtain more milk by "phooka" made the animal irritable and ill-tempered.

Physiological Aspect.

What is phooka? It is an act of blowing air or the insertion of any irritant into the vaginal passage with the object of making the animal yield more milk. Mucous membranes of organs are sensitive, but some are more so where the nerve supply is greater. In ordinary milking tickling of the teats is quite sufficient to bring congestion which sympathetically brings stimulation to the udder, while in phooka to bring stimulation to the udder congestion is to be produced by some irritant substance introduced into vagina. Stimulating the nervous system off and on unnaturally, invariably brings on irritability of nerves which frequently develops into vice. Is it psychological reflex or physiological action? It may be probable that the first two acts are quicker in action than the third one.

Experiments.

Since the cow was very debilitated I took the opportunity to test the animal for tuberculosis, but it proved negative. Microscopical examination of milk and animal experiments as inoculation into guinea pigs also proved negative. It was more than a month since the animal was in the hospital and careful observation every day brought to my notice that the cow grew more docile day by day and had shown, though not very perceptible, an improvement too. From this one should understand that nervous irritability brings general changes in the constitution. This case has clearly proved that the phooka methods used by ignorant people are really cruel and should be discouraged and condemned wholesale.

Discussion.

Here and there, in India, through ignorance, keepers of the dairy animals — poor as well as rich — adopt such method during the lactation period with the result that the animal becomes sterile. It is a decided fact, from breeding-point of view, that phooka is very serious and most injurious to the animals' health. It is more prevalent in cities, although villages are not free from it. Veterinary Surgeons who come across with such cases should immediately take legal steps in the matter and rescue the poor animals from the tortures of the wicked folk.

Conclusion.

It can be concluded that wildness or brutal character acquired by the subject in question was entirely due to "phooka."

I would like to thank Mr. K. R. Aiyer, G.B.V.C., who willingly rendered help in the bacteriological examination and inoculation of experimental animals.

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Vitaminosis B

From what is coming to light about the vitamin B complex, there is little doubt that an insufficient amount of this factor is contained in the regular rations of man and higher animals. The deficiency syndrome runs through the whole gamut of nervous and asthenic symptoms: irritability, depression, fatigue, inappetence, constipation, convulsions, paralysis, heart failures, hysteria.

Of the twelve fractions of vitamin B now known, five have been produced in crystalline form: nicotinic acid, thiamin chloride, riboflavin, pyridoxin and pantothenic acid.

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Editorial

THE CEYLON VETERINARY ASSOCIATION

The pretty little island of Ceylon lying south of India is making history in the Veterinary world. Just a year ago, in July 1940, the members of the Veterinary profession in that land who were a 'loosely scattered lot' decided to organise themselves not only "in their own interests but also to make their contribution to the development of Animal Husbandry in that country." The result was the formation of the Ceylon Veterinary Association. The first Annual report of the Association which has been received by us now gives us an indication of the spirit of earnestness and enthusiasm with which the members have started on their work. Whether in Government service or in Private Practice, whether in active duty or in the retired list, the members of the profession in that island have banded themselves together to advance the profession in all possible ways. We note with pleasure that the activities of the Association are ably guided by its President, Mr. R. J. Little, Municipal Veterinary Surgeon, Colombo, (whose sparkling sprightly face adorns the frontispiece of the report) assisted by the energetic secretary Mr. Hector C. Perera.

We are very glad to note that the Association has started on its activities during the first year of its existence in the right direction by paying prominent attention to propaganda work. Too much emphasis cannot be laid on this aspect of the

work of the Association because it is only by educating the public on the various problems of Animal Husbandry that the Veterinary profession can come into its own. In the past and even in the present, it has become a habit with the Veterinarians to hide their light under a bushel and develop what one should regretfully call an inferiority complex. On that account it often happens that the work of a Veterinarian, however fine it may be has remained unknown and unrecognised. It is therefore pleasing to note that the Ceylon Veterinary Association has begun its work by paying attention first to the Education of the Public on matters relating to Animal Husbandry. More than twenty articles of popular interest have been contributed by the various members of the Association to different popular periodicals and we are sure that these articles are bound to draw the attention of the public to the potentialities of the Veterinary profession. (We wish these articles had been published as an annexure to the Annual report for ready reference of readers. Probably this is a bit of Newsprint economy necessitated by war conditions.) The prevailing popular impression that the Veterinary Surgeon has no other duties or functions except to attend to the ailing and sick animals should be dispelled. The public must be convincingly told that a Veterinary surgeon is something more than what his title means and that he has very many functions such as eradication of diseases by paying attention to nutritional and genetic aspects of Animal breeding and also safeguarding of Public Health by a thorough examination of animal products intended for human consumption. The functions of the Veterinary surgeons should be constantly kept before the public mind by periodic contributions to the lay press and therefore we would earnestly advise the Ceylon Veterinary Association not to slacken their propaganda work but to keep it up and even improve it by supplementing with magic lantern or cinema demonstrations of Veterinary Subjects.

We wish the young Association all success in its efforts "to advance the profession's prospects and scope of its usefulness".

Clinical Articles.

BREECH PRESENTATION OF A MEGALOCEPHALUS MONSTER IN A COW

BY

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Junnar, Poona.

Subject:—A country cow, aged three years belonging to a villager of Manikdoto, Taluka Junnar, was admitted as out-patient on 8th November 1940.

History:—The cow which was in her first pregnancy had completed the full term. It was showing signs of calving on the 7th of November 1940, in the village; the water bag had burst and the hocks of the calf were just visible outside. As there was no further progress, the owner tried his best to remove the foetus but only in vain. Therefore he brought the animal to the Veterinary Dispensary, Junnar, in a cart on 8th November 1940.

Immediately on arrival half an ounce of chloral hydras was given in treacle and the case examined with the normal antiseptic precautions.

The case was evidently one of posterior presentation.

The buttocks and hind hoofs were the first parts that the hand encountered, followed by the croup and the haunches. As the calf was dead and bloated, I punctured the abdomen and let out copious liquid and gas. I passed a cord with a ring round the hocks and secured the same. With the help of three of my assistants, I applied traction and thus removed the foetus.

The peculiarity of the foetus was as follows:—

1. It was a 'Megalo-cephalus Monster' the head erect and frontal bones flat.
2. The lower lip protruded a little farther than the upper and the dental pad absent.
3. Both the fore limbs were intertwined.
4. The hocks and knees were highly developed at the expense of the canons. The pasterns were very short.

5. The spinal column bent like a bow.
6. Most of the internal organs were found to be normal except the right lung which was very small.

The cow was given a saline douche and discharged in the noon as the owner was unwilling to stay. Before discharge, a stimulating dose was administered.

CÆSAREAN SECTION IN A BITCH

BY

V. V. VENKATACHALA AYYAR, G.M.V.C.,
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A bitch was brought to the dispensary at 5 P. M., on 4-4-40, with the following history and symptoms:—

Advanced stage of pregnancy, dullness and inactivity for the previous 3 days, feeble infective labour pains now and then.

On examining per vagina, it was found that one of the limbs of a foetus was in the passage but the Os was not fully dilated. Application of the forceps was found difficult and there was a suspicion of uterine rupture. It was therefore decided to deliver by cæsarean section.

After the usual preparation, the patient was given chloroform anaesthesia and she was well under in about 8 minutes.

An incision of 6 inches long was made on the median line, muscles were separated and secured taking care not to injure blood vessels. Simple dry sponging alone was resorted to. Peritoneum was incised and secured separately. The abdominal organs were gently pushed to a side and the uterus exposed. An incision 6 inches long was made on the uterine wall and the edges were secured. The fluid contents of the uterus were gently sponged out, care being taken to see that none fell into the peritoneal cavity. Two dead pups were removed from near the cervix and two live ones from the left horns. The live pups were attended to by the timely removal of foetal membranes, etc.

On examination of the uterine wall it was found to have had a rupture about 2 inches long at its superior aspect.

The uterus was gently taken out of the abdominal cavity and its interior cleaned and sponged with 2 per cent Acriflavine solution. The

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rupture and operation wound were sutured with sterile catgut and the uterus replaced. Peritoneum and muscle were sutured separately with catgut and skin wound with silk ligature. A pad of gauze and cotton was applied over the wound and bandaged.

Second day.—Temperature 104° F. There was a little discharge from the wound. It was cleaned and rebandaged. 3 c.c. camphor in oil was given subcutaneously.

Third day.—Temperature 104° F. She was given quinine mixture. The wound was dressed with H₂O, and Boro Iodoform.

Fourth day.—Temperature 104° F. Repeated internal and external treatment.

5th to 15th day.—Dressing was continued. Quinine mixture was discontinued on 10th day and carminative with tonic substituted.

Result.—The patient was discharged cured on 26-10-40 and she is quite well now. One of the pups which was very weak died on the 8th day but the other is alive and well.

A CASE OF MULTIPLE HYDATID CYSTS IN THE INTERNAL ORGANS OF A COW

BY

V. V. VENKATACHALA AYYAR, G.M.V.C.,
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A country bred milking cow was brought to this institution on 19-6-40, with the following history:—

The animal was quite healthy the previous evening and was left in the shed as usual. She became suddenly ill showing great distress in breathing at 2 A. M. Stopped eating and ruminating. She was walked forcibly from the house to the hospital (literally she was pushed from behind), as she had no inclination to move.

On examination, the animal was found with her head and neck extended, fore limbs kept wide apart, anxious look, more disposed to stand than lie down, tongue protruded, frothy saliva dribbling showing all evidence of Dyspnoea. Her temperature was 100.4° F and auscultation of lungs revealed dullness of both lungs.

To allay this distress in breathing, I tried to give her an electuary containing Adrenalin and Chloretone, but she was not able to swallow it.

Suspecting it to be a case of choking, I carefully examined the pharynx and the cervical portion of the oesophagus but could not detect anything abnormal. I therefore decided to pass the probang and got everything ready for the operation but in the meanwhile the animal fell down suddenly and died within about 20 minutes of its coming to the hospital.

I advised the owner to leave the carcass at the hospital for post mortem examination, as I was very anxious to know what really caused the urgent symptoms and death.

On opening the abdominal cavity a small quantity of peritoneal fluid was found but the peritoneum itself was quite normal. The liver, spleen and lungs were found studded with cysts varying in size from a marble to an apple. About 60 such cysts could be counted in the lungs alone. Two of the size of a lemon were found on the trachea at its entrance into the thorax. Three big cysts were found to have ruptured in the lungs.

Extensive destruction of normal lung tissue, pressure on the trachea and discharge of cystic fluid into the lungs caused the urgent symptoms of asphyxia and death.

The cysts were sent to the Principal, Madras Veterinary College, who kindly identified them as 'Hydatids.'

Remarks.— This happens to be an instance of mistaken diagnosis and my endeavour to pass the probang would surely have caused the poor patient greater distress and no relief.

CLINICAL ASPECT OF ANTHRAX AND HAEMORRHAGIC SEPTICAEMIA AS MET WITH UNDER VILLAGE CONDITIONS.*

BY

G. G. CHEBBI, G.B.V.C.,

Veterinary Assistant Surgeon, Dharwar, Bombay

Anthrax and Haemorrhagic Septicaemia are two of the important epizootic diseases to which our livestock of the bovine class fall a prey periodically. The Veterinarians are called to control them. The intimation reports received from the village officers regarding the outbreak of the

* Paper read at the Bombay Veterinary Medical Association annual conference, held at Dharwar in December 1940.

disease in their villages is so vague that the field workers have to depend for the diagnosis of the disease, on the symptoms of the affected animal as narrated by the cattle owner, or, on the examination of the sick cattle at the time of the visit, or, at times, by the holding of post mortem examination on a dead animal. Of course microscopical examination and biological test are the final conclusive evidences.

The symptoms of both these diseases of acute type would be very few and not forthcoming many a time. It is on a rare occasion that one meets with a case as described in text books. It is only the experience that ultimately guides us correctly. I had an opportunity of attending to as many as 36 outbreaks of Anthrax and 114 of Haemorrhagic Septicaemia during the past 3 years and 8 months at Dharwar (since 1-4-1937 to 30-11-1940). During the course of attending to them 29 specimens of blood for Anthrax were got examined and 9 were positive and in Haemorrhagic Septicaemia 34 specimens were got examined with 13 positive. With this much of data at my command I have tried to summarise the disease comparatively with a hope that they may be of some use to a field worker.

Species of animals affected and their ages

Generally in Anthrax, adults and aged cows have been found to be the first to get the disease in a majority of outbreaks. Buffaloes and young ones are by no means immune: but they come next in order.

While, in an outbreak of Haemorrhagic Septicaemia, young buffaloes are found to be the first victims but as the disease spreads, casualties among adult buffaloes and cows occur.

Season

The period from the close of winter to summer appears to be the favourable season for Anthrax: notwithstanding this, sporadic outbreaks may occur at any time during the year.

Haemorrhagic Septicaemia outbreaks generally commence with the advent of monsoon when the first grass grows after showers and the disease comes down about September.

Locality

As regards locality, low lying marshy places of Malnad tract where there will be clogging of water and beds of nallas in plains, have been found to be the hot beds of both these diseases.

Symptoms

I am not touching the acute cases of Anthrax as opportunities to observe them are very rare. The only history that may be forthcoming in

such cases is, sudden death of susceptible cattle on grazing area or in cattle byre, before day break, which leads us no where. But in sub-acute cases of Anthrax that were mostly observed by me in Kalaghatgi and Dharwar Talukas where the disease proved positive on microscopical examination, the following symptoms were marked. The animal will go partially off feed, stand dull and stiff with swinging head and there will be slight dribbling of saliva but the tongue will be unaffected. Swellings may appear on throat, jaws or any part of the body and death after two, three or even four days of attack. Percentage of recovery is 5 to 30 per cent. in this disease.

But in a case affected with Haemorrhagic Septicaemia the animal will be completely off feed with inflammation of the tongue and throat and with profuse salivation. Breathing will be sterterous producing hoarse sound which could be heard from a distance and terminating in death from within a few hours to 24 hours. If it survives that period recovery is probable. The mortality percentage is very high — 99 per cent.

Morbid changes

All the post mortem examinations were done with all the necessary precautions.

In Anthrax, subcutaneous tissue under the lesion will be infiltrated with yellow gelatinous exudation and peripheral veins, when cut will exude thick tarry blood.

Heart and Lungs.—These are the secondary seat of lesion with lesser degree of congestion due to septicaemia. The right ventricle will be either empty with the endocardium stained with the tarry blood or it may contain a little of non-coagulating tarry blood. Left ventricle is mostly empty.

Spleen.—Spleen will be typically swollen and enlarged about 4 or 5 times the normal size and when cut the pulp will be soft and could be drained off if held up with the apex.

In Haemorrhagic Septicaemia there could be seen haemorrhagic infiltration of the subcutaneous tissue with thin icterous exudation.

Heart and lungs are the chief seats of lesions. The covering of the inner lining and the muscular tissue of the heart are all generally inflamed causing peri-endocarditis and myocarditis. The right ventricle will usually show a blood clot in one mass the colour of which will be deep chocolate. Lungs will be found with stained blocks of congested area in varying degree as in the case of lobular pneumonia.

Trachea and Bronchii will be mostly studded with white frothy stuff.

Lastly I may point out that there is one seriological test for Anthrax called "Ascol's thermo precipitation reaction" advocated in 1935 as the only *post mortem* test :—(*Vide Bacteriology by Day and Chatterji, p. 366*).

Technique of the test.—Take a piece of spleen from the suspected animal and boil with ten times N. S. S, cool and filter. To the filtrate add some immune serum by pipette into the bottom—a progressive deepening ring of turbidity appears at the junction of the fluids, if the disease is positive.

If this test could be done by the Veterinary Assistant Surgeons in the field, I think there would be rapid diagnosing of the disease.

Reference

Bacteriology by Day and Chatterjee, p. 366.

Annual Administration Report of the Veterinary Dispensary, Dharwar, 1937 to 1939.

Personal Notes.

A CASE OF AVIAN TUBERCULOSIS.

BY

K. N. KRISHNAN, G. M. V. C.,

Veterinary Assistant Surgeon, Kodaikanal.

Subject ;—Austrolop hen, three years old.

History ;—A good layer, laying from 200 to 250 eggs a year. About the beginning of July 1938, the hen suddenly stopped laying and went off its feed. The feathers started falling off and never grew again. The owner of the bird who knew something about poultry, diagnosed the condition as indigestion and treated it with various medicines. About two months after the treatment the bird's appetite returned ; but it was gradually losing condition. It was brought to the hospital for treatment on 9-11-38. The bird presented a typical picture of emaciation. Its coat was very pale, so also the mucous membranes. It could not move as paralysis of the legs had set in. Its temperature was low, 104°.

Treatment.—The condition was tentatively diagnosed as anaemia and it was decided to put the bird on a course of iron tonics. But it died the next day after admission into the hospital.

Result.—A post mortem examination was made. The chief post mortem findings were :— 1. Small tubercles in the liver and spleen, 2. Congestion of the kidneys, 3. Patches of congestion in the intestines. The other organs were, normal. The organs were submitted to the Principal, Madras Veterinary College, for examination and his report is as follows :—

Report of the Principal.

1. Liver:—Caseating tubercles, in which, acid fast bacilli indistinguishable from myco-bacterium tuberculosis present.
2. Kidney:—Cloudy swelling of the tubules with colloid cysts in them indicative of tubular nephritis.
3. Spleen:—Caseating tubercles in which acid-fast bacilli indistinguishable from myco-bacterium tuberculosis present.

Remarks.—I believe that some birds die of tuberculosis every year at Kodaikanal, though this is the only case I have come across during the course of my stay of 2½ years in this place. When a bird is sick, the owner generally kills the bird and thus there is no chance of proving the extent of the prevalence of tuberculosis among fowls. But a fowl with a history of progressive emaciation may now reasonably be suspected for tuberculosis.

TREATMENT OF OSTEOPOROSIS IN HORSES.

BY

V. D. Ratnam., G. M. V. C.,

Veterinary Assistant Surgeon on Glanders Duty, Madras.

In my article on the diagnosis of Osteoporosis in horses published in the Indian Journal of Veterinary Science and Animal Husbandry, Vol. X, Part I, March 1940, (published elsewhere in this issue of this journal) it was recorded that 12 out of 22 cases of Osteoporosis treated with Calcium Carbonate showed some improvement. But the improvement was not 100 per cent. to give a negative test when the animals were subsequently tested for Osteoporosis. As I could not get the drug Colloidal Magnesium Hydrate anywhere in India or in England, the question of substituting it with a suitable drug to help the absorption of Calcium and its retention in the system was often engaging my attention.

It was observed that, with the administration of Calcium Carbonate alone some animals definitely took a very long time to show any appreciable improvement; in some cases, the improvement noted was even almost negligible. For instance, two horses which were suffering from lameness of obscure origin and which gave a positive test for Osteoporosis in the beginning, took nearly eight months to give a negative test. These animals went sound afterwards and one of them won a Gymkhana Hunt Race at Ootacamund during the last season. Two other horses, which were always lame and which gave a positive reaction to the test, had Calcium Carbonate for a pretty long time (nearly nine months) but no appreciable improvement was noticed either in the lameness or in the hardening of the frontal bone when

tested again. These two animals were therefore destroyed and on p. m. one was found to be suffering from Ulcerative Arthritis on the digital and of the off-fore canon bone and the other was found to be suffering from Navicular Disease in a bad form on the near fore.

The treatment was therefore modified and the following combination of drugs was tried:—

Calcium Carbonate.	1 oz.
Bone Meal.	1 „
Mag. Sulph.	2 „

This is to be given either in one or two feeds daily for two or three months; if required it may be given for a longer period.

This treatment has been found to give satisfactory results in cases of Osteoporosis in early stages. After giving a fairly long trial to this treatment, I am of opinion that if the animals are treated in the early and incipient stage, many cases of obscure lameness in horses due to Calcium deficiency can safely be avoided.

In this connection I would like to mention that, before this test and treatment was adopted by me in the Body Guard, the average number of cases of lameness for a day was from 6 to 8. Now practically during the last one and a half years during which this test and treatment has been practiced, the incidence of cases of lameness has gone down very low, it is less than one or two a day. The animals also are in a much better condition than they were ever before.

AZOTURIA

BY

S. A. Sastri, G. M. V. C.,

Veterinary Asst. Surgeon, Ootacamund.

This disease is frequently met with in the hills. Idleness and rich diet are supposed to be the cause of this condition. I furnish below details of two cases treated by me in Ootacamund.

Subject.— Bay Australian mare, aged about 12 years.

History.— On 25-8-40 the animal which was getting a rich diet of concentrates and only gentle walking due to rains was ridden in a good hunt in drizzling rain. Suddenly it began to perspire profusely and show colicky symptoms (turning the head to the flank). It passed small quantities of bloody urine at repeated intervals and was terribly lame off hind. The mare was taken to the stable with the greatest difficulty.

I saw her in the stable. Temperature 102.2°. M. M. highly congested, enormous swelling at the off-hip, and little at the near hip. The animal was restless, would not touch grass, or drink water, was stamping the ground ceaselessly and attempting to lie down. Suddenly she went down, stretched out her legs and could not get up easily. Realising that it is unsafe to allow her to be in the recumbent posture a long time, she was forced to get up. She did so with great difficulty and assistance.

The pulse was rapid, respirations accelerated, and heart was palpitating.

Treatment.— Hot fomentation to the hip every two hours and application of Linimentum Belladonna. Stable bandage to all four legs. Massage of the hind limbs. A pint of linseed oil with half an ounce of chloral hydrate and two drams of Pot. Iodide was given by stomach tube. Warm soap water enema was also given. Two drachms of liquor adrenalin hydrochloride was injected subcutaneously morning and evening.

Plenty of linseed tea was ordered for drinking and the animal drank it well, but it refused bran mash. Carrots were given in small quantities. Gentle walking exercise was ordered every two hours.

Examination of the blood and dung was negative.

26-8-40. Temperature 101.8°F. M. M. a little clearer. No motions, urine slightly less bloody, but highly albuminous. Swelling over the hip less tense. Prescribed two drams of Acid Boric and Pot. Acetas, morning and evening in drinking water. Fomentation and Linimentum Belladonna to the swelling was continued.

27-8-40. Temperature 100°F. The mare had several broad motions, urine was normal. M. M. pale. The animal lay down and got up easily. Swelling became reduced greatly. The powders were continued.

28-8-40. Motions still loose. Continued the powders. Urine clear, swelling much reduced. The animal was given small quantities of oats and bran. The animal was allright in another three days. Regular work was ordered after ten days.

CASE II

Subject.— Chestnut Irish Gelding, age six years. Took ill on 1-12-40.

Symptoms.— Off-feed, slight colicky pains, scanty amount of bloody urine. M. M. congested. Temperature 103°F. Hard tense swelling both hips.

Treatment.— The same treatment as for the first case was adopted with almost the same results. But the urine had to be removed on first visit by catheter. Third day the urine was highly albuminous and whitish.

WORM IN THE ANTERIOR CHAMBER OF THE EYE OF A BULLOCK

BY

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

Veterinary Assistant Surgeon, Bezwada.

History.— An Ongole bullock, case No. 900, aged 12 years, was admitted into the veterinary hospital, Bezwada, on 19-7-40 with the history of lachrymation of the right eye for some time past with subsequent intractable opacity. The animal was purchased by the owner four months previously and as far as the owner could remember, the animal was given only tap water to drink.

Symptoms.— There was a dense opacity of the eye ball with lachrymation and photophobia. On irrigating with 1 per cent saline solution, the wriggling of a worm in the anterior chamber of the eye was noticed.

Treatment.— The animal was thrown and secured. The eye was cocainized with 4 per cent. solution. The cornea was punctured at the limbus and the worm was extracted. About 2 drops of 1 per cent. solution of Atropine Sulph was dropped into the eye and the animal was released. Subsequent treatment consisted in irrigating the eye daily with saline solution and dropping into the eye a few drops of 1 per cent Potassium Iodide Solution till 25-1-41. The animal made an uneventful recovery.

The worm has been identified as "Immature female *Setaria Labio Papillosa*"

MILK FEVER

BY

S. A. SASTRI, G.M.V.C.,

Veterinary Assistant Surgeon, Ootacamund.

This disease is frequently met with in heavy milkers such as foreign and cross bred cows and of all ages.

Generally it is noticed on the second or third day after calving.

For the last six months I treated 4 cows (3 English and one cross-bred) of an average weight of 1000 lbs.

In the first case, the cow became sick on the third day after calving. It lay down on her brisket turned her head round, resting on the chest, with her nose pointing towards the flank.

Temperature was normal, breathing laboured. General appearance sleepy, urine was not passed for 12 hours.

Treatment:— Warm soap water enema was given and urine was removed by catheter. Gave a subcutaneous injection of

Calcii Sandoz 1 ounce

Acid Boric ℥ii

Aqua Distillata 8 ounces.

The powders were well mixed and the liquid boiled, cooled and filtered.

The udder was insufflated after removal of milk and the teats were tied with tape to retain the pumped in air. The owner was instructed to remove the taps after the cow got up. It was up in two hours and was perfectly fit and required no more treatment.

The other cases were treated on the same lines as above.

One cow however had a relapse on the second day. The first injection had its effect and the cow rose to her feet in two hours. But after 24 hours she was down again. She was given another similar dose and this made her rise up in one hour.

Thereafter she was perfectly fit.

TOBACCO POISONING IN A CALF

BY

V. VENKATARAMAN, G.M.V.C.,
Veterinary Assistant Surgeon, Dindigul.

Subject:—A local bred she calf, aged about 16 months, in fair condition.

History:—The calf was said to have eaten inadvertently about a couple of dried tobacco leaves with straw, on the morning of 29-12-'40 and in about two hours she was found sick.

Symptoms:—Very dull, depressed, shivering, salivation, pupils dilated, had a vacant look about it, stertorous breathing, nostrils dilated, muzzle dry, temperature 100°F, frequent micturition in small quantities, bowels normal, pulse quick, grinding of teeth, groaning and inability to get up.

Treatment:—Cold water was dashed to the head and the following mixture was given.

R,

Liqr. Strychnine ℥i
Caffeine citras grs. XXXXV
Sugar ℥iii
Aqua Chloroform ℥vi

M, Ft. Mist, Sig. 1/3 part every two hours.

MOIST ECZEMA TREATED WITH MILK INJECTIONS 37

The following powder was given

R,

Mag. Sulph. ℥ii
Sodi Sulph ℥ii
Pot. Acetas ℥iv
Ammonium Chloride ℥iii

M. Ft. Pulv. ii Sig One in feed and in drinking water.

The urine cleared on the seventh day and the swelling on the fourth day. The animal slowly came back to normal and was brought out hunting on the 14th day.

TREATMENT OF MOIST ECZEMA BY SUBCUTANEOUS INJECTIONS OF STERILE COW'S MILK

BY

B. VENKATARATNAM, G.M.V.C.,
Veterinary Assistant Surgeon, Parvatipur.

Moist Eczema is a non-contagious skin disease affecting various regions of the body and is characterised by erythema and intense pruritis.

In the veterinary dispensary, Parvatipuram, 17 cases of this complaint were treated with sterile cow's milk injections and all of them were cured.

The following table gives the names of species treated and their ages:—

Species.	No. of cases.	Age				Remarks.
		Below 4 months	Between 4 to 6 months	Between 6 to 12 months	Above one year	
Bull calves	7	6	1	...	...	
Heifer calves	5	4	...	...	1	
She buffalo calves	2	2	...	...	...	
He buffalo calves	1	1	...	...	...	
Dogs	2	...	1	1	...	

From the above table it can be seen that the complaint was chiefly among cattle under four months of age.

Symptoms.— There was inflammation and the formation of small vesicles which became confluent and caused the animal much irritation. Consequently the animal scratched violently and this resulted in the formation of red raw surfaces denuded of hair. The skin in some cases became thickened and wrinkled. There was also oozing of vesicular fluid but there was no formation of scabs or crusts. The parts affected were the inner aspect of the thigh, elbow, belly, inter-maxillary and perineal regions. The ventral aspect of the body (where the hair is sparse and delicate and the skin thin and sensitive) seems to be commonly affected. In most of the cases the lesions were confined to the inner aspect of the thighs and belly, but in a few cases the lesions were found extended to the elbows, inter-maxillary region and perineal region. Scrapings from all the 17 cases revealed no mange mites.

Treatment.— Before having recourse to treatment by milk injections two cases were treated at first with the application of mange-dressing; but even after five days no improvement was found. Then treatment by milk injections was taken up and with one injection marked improvement was found even after the very next day. There was blackening of the affected parts and gradual growth of hair. Complete cure was effected in five days. The majority of the cases were cured with one injection only while very bad cases required three injections for a complete cure. Milk injections were given subcutaneously at the rate of 15 c.c. for bovines and 5 c.c. for canines.

Details of animals treated, number of injections given and the time taken for cure are furnished in the table given below.

No. of animals treated	No. of injections per animal.	Time taken for cure.	Result.	Remarks.
12	1	5 days	Cured.	...
2	2	7 days	-do-	...
3	3	12 days	-do-	...

Preparation of the injection.— Milk from a healthy cow is taken and filtered into a sterile test tube. It is heated till it begins to boil. It is then cooled. The required quantity is taken and injected subcutaneously.

Advised the administration of strong coffee with sugar, gave Benzoin fumigation, warm clothing to the body and limbs after a good rub.

30-12-40. Animal slightly better, passed a few pellets of dung, urination increased, passed less frequently, pupils normal, but animal unable to stand or walk: when made to stand the calf fell. Temperature 101.0°F. Respiration and pulse improved. Prescribed the following mixture,

R.	
Caffeine citras	grs. XXX
Ammon. carb.	℥iii
Tr. Nux vomica	℥iii
Tr. Digitalis	℥i½
Tr. Scillae	℥iii
Infusion Thalachuruli	℥i½
Sugar	℥vi
Aqua chloroform	℥xii

M. Ft. Mist. Sig. ½ part thrice daily.

Mag. Sulph ℥iv, Ammonium chloride and Pot. Nitras each ℥ii was advised to be given in drinking water. Massage and warm clothing continued.

31-12-40. Animal better, ate a little grass, ruminated a little, urination better. There was still muscular weakness. Continued the mixture without caffeine citras and the powder in drinking water. The above treatment was continued for 3 more days.

3-1-41. Animal showed gradual and decided improvement, was able to walk about 100 yards, took food and ruminated. Mag. Sulph. ℥iv, Sodium chloride ℥i, Pulv. Ginger ℥ii, Treacle ℥vi was given in half a pint of water. Enema was given. Continued the mixture of 31-12-40 for another 3 days.

6-1-41. Animal decidedly better, more or less normal. Treatment stopped. Advised swimming for about 15 minutes daily.

10-1-41. Animal normal, declared cured.

Remarks:—There was extreme muscular weakness, probably due to central or peripheral nervous derangement, as in Palapoodu poisoning (please refer to the article already published, V.J. Vol. XVII No. 6) The infusion of Thalachuruli was found to be useful in the latter case. So I ventured to try that in tobacco poisoning also, where the symptoms to a certain extent were similar and the results of treatment seem to be encouraging, but it will require a few more trials to declare the efficacy of the juice of Thalachuruli in cases like this or allied ones.

Association News

THE CEYLON VETERINARY ASSOCIATION BRIEF HISTORY OF ITS FORMATION

The history of the veterinary services in the Island goes back to nearly fifty years. It began with the appointment of a Veterinary Surgeon to the Department of Public Instruction. Five years later, however, a separate department was formed and continued to exist as such till 1936 when it was absorbed into the Agricultural Department. Prior to 1931 two officers were recruited from England but, from 1931 to the end of its existence as a separate Department, it consisted of one officer recruited from England and the other assistant veterinary surgeons were trained and qualified in India.

The Colombo Municipal Veterinary Department began as a part of the Health Department. In 1906 it was converted into a separate Department with Mr. W. A. de Silva, now Minister of Health as its first Veterinary Surgeon. The Kandy Municipality has no separate Veterinary Department but appointed Mr. D. Seneviratne as its first veterinary officer. Incidentally it is amazing that neither the Municipality of Galle with a population of over 40,000 inhabitants, or any other U. C. in the Island, employ veterinary surgeons.

Though the veterinary service has been in existence for nearly half a century it has never had an Association. Two factors were mainly responsible for this. One was the smallness of their numbers and the other was the way the members of the profession were scattered throughout the Island. For instance so short a time as five years ago Colombo had only four private practitioners. Today there are well over a dozen members of the profession practising in the City. With the growth of their numbers the veterinary surgeons had for sometime felt the need for an influential Association which could espouse their cause and promote their science.

On a Sunday in May 1940, therefore, what might be called an "exploratory" meeting was held at the "Towers" Maradana of eight veterinarians. Besides Mr. R. J. Little, the Colombo Municipal Veterinary Surgeon, who presided, there were Messrs T. M. Z. Mahamooth, the Veterinary Research Officer, Department of Agriculture (representing the Government Veterinary officers) J. C. A. Prins, A. V. de Croos, C. A. Dias, L. P. P. Goonetilleke (Colombo Municipality) and L. A. P. Brito, Babapulle and Hector C. Perera (Private Practitioners.) The discussion lasted three hours and ultimately it was decided to take steps to form an Association. Mr. Hector C. Perera was

appointed Secretary pro tem, with instructions to circularise all the veterinary surgeons in the Island asking for their support and co-operation in the venture. Accordingly the following circular letter was despatched on the 27th June 1940.

Frankfort Place
Bambalapitiya
27th June 1940.

Dear Sir,

It is with pleasure that I address you this letter.

At an informal gathering of a few Veterinary Surgeons held recently, it was decided to form an All Ceylon Veterinary Association to safeguard the veterinary profession and to promote our science in Ceylon.

I do not think I need labour at length to explain the need for such an Association. When we look round we find every profession and trade having its Association to look after its own interests. But we veterinarians have nothing of the kind. To-day, the veterinary profession in Ceylon neither commands the respect of the public nor does it enjoy the same status as its allied professions — Medical and Dental. This is entirely due to our fault. In the past we have been a loosely scattered lot without an Association to ventilate our grievances or a journal to espouse our cause. Today our members have increased with an unfortunate decrease in our privileges.

There never was the need for an Association as there is today. Unity is strength and we must now all band ourselves together to show our solidarity. This can best be achieved by forming an All Ceylon Veterinary Association of which we can all be members, irrespective of the positions we hold.

In view of these facts I hope you will give your earnest support and co-operation and enable us to form the Association. It has been decided, provisionally, to hold our inaugural meeting on Sunday the 28th July 1941. at 10 a.m. at the residence of Mr. L. A. P. Babapulle, M. R. C. V. S. at 19th Lane Colpetty, Colombo.

I shall be very grateful if you will kindly let me know without delay your views on the matter and any suggestions you might have to make.

Thanking you and anxiously looking forward to hearing from you soon.

Yours faithfully,
Hector C. Perera,
Secretary Pro. tem.

The response to the circular letter was very encouraging. Practically all the Veterinary Surgeons wrote back pledging their support. On the 23rd of July, the "Times of Ceylon" in a special article broke the news to the public that Veterinary Surgeons in the Island were going to form themselves into an Association. In the course of the article the paper said, "Immediate measures to check quackery by pseudo veterinary surgeons all over the Island are being taken by the Government whose representatives along with the Municipal authorities will meet on Sunday morning at the Municipal Veterinary Surgeon's Office at Maligakanda to form the Ceylon Veterinary Association, which will be the first colonial veterinary association to be organised. The Minister of Health has been invited to preside and the Governor and the Minister of Agriculture are also expected to be present."

The formation of such an association, it is felt cannot possibly be delayed any longer, in view of the safeguards that must be immediately enforced to stop the damage done by quacks all over the Island. The possession of half a dozen dogs, and a second hand drug counter, it is stated, seems to be all the qualifications needed to be a successful veterinary surgeon, particularly in rural areas. This unchecked malpractice, it is pointed out, has been one of the chief contributory causes of the spread of rabies. Several positive cases of rabies, have remained undetected, as these pseudo-veterinary surgeons have diagnosed and treated such cases attributing, the ailment to some fictitious cause, extracting in the meanwhile the most exorbitant fees for their "professional services". When the animal eventually dies, the carcase is usually thrown in the dust-bin and is carried away by the street scavengers to the refuse destructor. The case of rabies remains undetected, no preventive measures are possible as a result and the menace goes on unchecked.

The Association which will be formed on Sunday will provide for the membership and registration of the qualified veterinary surgeons in the island, whose services alone will be available to the public."

The inaugural meeting then was held on the 28th July 1940 in the office of the Municipal Veterinary Surgeon, Colombo. More than, half the number of veterinary surgeons in the Island were present, many having travelled from different parts of the Island to attend the meeting. The Hon'ble Mr. W. A. de Silva, Ceylon's Minister of Health and the first Ceylonese to qualify as a veterinary surgeon, presided. The Hon'ble Mr. D. S. Senanayake, Minister of Agriculture and Lands was also present.

After Mr. Hector C. Perera had read the notice calling the meeting Mr. W. A. de Silva addressed the meeting. The following account of the speeches and the proceedings is from the "Ceylon Daily News" of the 29th July 1940.

Two Objects

Mr. W. A. de Silva, the Minister of Health presided and in opening the proceedings expressed his pleasure at the decision of the veterinary surgeons to form an association. He remembered the time when there was only one qualified veterinary surgeon in Ceylon. They had now a fairly large number of them and it was their duty to do their best for the advancement of the science which they had been fortunate enough to study and to organise themselves into an association for two purposes. The first was the spread of knowledge regarding veterinary matters and the second, incidentally, was to look after the interests of the profession. They should, however, refrain from trying to make their association a trade union. They should not expect legislation to be introduced to prevent anybody else from treating an animal. That was not done anywhere in the world.

Much Work to do

Continuing, Mr. W. A. de Silva said that there was a great deal of work for a Veterinary Association to do. The Minister of Agriculture would be able to tell them that he had only a few officers trained in animal husbandry and that it was not possible to organise a comprehensive scheme for promoting animal husbandry in Ceylon.

"Millions of rupees worth of milk foods are imported into Ceylon annually, continued Mr. de Silva. But we have pasture land and cows, and proper steps should be taken to have our own milk supply and to obtain facilities to have the milk transported. It is for the Veterinary profession in conjunction with agricultural experts and instructors to investigate the problem. You have also to investigate the question of animal food. It is one of the most important matters that awaits attention in the Island. In olden times people had what might be called an instinctive knowledge, gained through the experience of ages, and their work will give you a clue to have some scientific data prepared so that those old ideas may be applied to advantage in modern times.

Knavery and Quackery.

Mr. R. J. Little, Municipal Veterinary Surgeon, in proposing the formation of the Ceylon Veterinary Association, said that it was the desire of the veterinary surgeons to ask the State Council to pass a bill for their registration in order to protect themselves and the public from knavery and quackery and to extend to them the privileges now enjoyed by other registered professional bodies. The Veterinary profession could by its knowledge of prevention of disease among animals be the corner stone of agriculture.

Mr. C. W. Pate seconded the resolution.

Producing More Milk

Mr. D. S. Senanayake, Minister of Agriculture, spoke of the benefits that the country could derive from such an association, and said that they were very fortunate in having as their Chairman that day the first Ceylonese Veterinary surgeon, who was also the Minister of Health. A few days ago, said Mr. Senanayake, he visited a health show at Mirigama. The Health Officer had spoken eloquently of how to bring up healthy children and build a healthy nation. He had asked them to start by taking milk and end by taking more milk. He (Mr. Senanayake) agreed with what the Health Officer had stated but there would not be the milk to start with and continue unless they succeeded in their activities. For the Minister of Health to succeed in building a healthy nation he must go back to his original love, the Veterinary profession. His presence there was an indication of the lively interest he continued to take in it.

Agriculture and animal husbandry had to go hand in hand. However much they might try to improve agriculture, unless animal husbandry was associated with it, there could not be any hope of success.

Mr. Senanayake continuing, said that he had full sympathy with the Association which was being formed because of the great task that lay ahead of it. They should consider that they belonged to a profession that was going to uplift the people of the country. They were unfortunate in Ceylon in another direction also. Ceylon students with brilliant qualifications obtained abroad started their careers in Ceylon with hopes of doing something for their profession and something for their country.

Importance of Research

"But what happened?" asked Mr. Senanayake. They are not encouraged to pursue their scientific studies. They never get an opportunity of doing any research. They are made to do routine work, that a clerk would do and we ask what do these people do? They have got their qualifications, but what have they done? Few people realise that it is not the individual but the system that is to blame. What I would like you to do is to get together not only for the exchange of ideas but also to obtain facilities to advance the scientific side of your profession." Mr. Senanayake continuing said that in the first place they had to husband the natural resources of the country and in the second they had to improve the livestock. When both were ready he had not the slightest doubt there would be ample opportunity for the people to go back to the land and live comfortably. If they were able to give those people the land and give each family a small cottage and give them good cattle and poultry he was sure they would tackle the problem of unemployment and poverty.

Cattle Food

They had an idea that nothing was good enough for their people and animals to eat and they considered it necessary to import foodstuffs. Was it possible for them to import foodstuffs for their animals and make animal husbandry pay? His view was that they should take their food from the land in which they lived and make use of the waste products for the benefit of the animals.

The proposal to form an association was carried with acclamation and proceedings terminated with a vote of thanks to the two ministers proposed by Mr. L. A. P. Babapulle and seconded by Mr. L. P. P. Goonetilleke.

CEYLON VETERINARY ASSOCIATION FIRST ANNUAL REPORT

Report for the Period July 1940—May 1941.

Your Committee presents with pleasure the first Annual report.

Members

The number of members on the roll is 45. This figure is all but one of the total number of veterinary surgeons in the Island. It is gratifying to note that even those who have retired are keenly interested in the progress of the Association.

Meetings

Besides the first General Meeting no other general meetings were held. The Committee met four times. All the Committee Meetings were held in Colombo. The average attendance at these meetings was 10. It was very encouraging to find some of the outstation members coming down to Colombo regularly for the meetings.

Finances

The expenditure of the Association was rather high because of the initial expenses. A full statement of accounts is attached to this report.

Private Veterinary Institutes

The number of private veterinary institutes has grown in recent years, there being ten to-day. They are Mr. A. Chinniah's Veterinary Hospital at Green Path, Colpetty, Mr. P. M. Fernando's Establishment at Pelpola Kotahena, Mr. G.N.G. Walles, Racing Stables at Highcliff, Havelock

Town, Mr. M. Lawrence's Veterinary Dispensary at Galle Road, Colpetty, Mr. L. A. P. Babapulle's Veterinary Chambers at Colpetty, Mr. E. F. Edirisinghe's Racing Stables at Lake Crescent Road, Messrs Rupesinghe's and Ratnatunga's Veterinary Clinic at Reid Avenue, Mr. Hector C. Perera's Small Animal Surgery at 29 Frankfort Place, Bambalapitiya, Mr. G. H. de Saram's Veterinary Surgery at Ratnapura and the S. P. C. A. Veterinary Hospital at Baseline Road, where a qualified Veterinary Surgeon is employed. Up to last year there was only one Veterinary Surgeon who was a race horse trainer but since then there are two, the new trainer being Mr. E. F. Edirisinghe Jr.

Oversea Services

Two Ceylon Veterinary Surgeons are engaged in military service overseas. They are Mr. A. Amerasinghe, who is in the Burma Frontier Forces and Mr. S. Subramaniam in Quetta, India. We wish them all success.

Retired

Two members of the Association Mr. G. H. de Saram, Assistant Government Veterinary Surgeon, Ratnapura and Mr. G. B. de Silva, Assistant Government Veterinary Surgeon, Colombo, retired during the course of the year, after long and distinguished service under Government. This brings the total to three—Mr. M. de A. S. Wijenayake, having retired some time ago. We wish these members every happiness in the future and hope they will continue to take the same keen interest they have always taken in the Association.

Honoured

Mr. M. Crawford one of our Vice-Presidents and Deputy Director of Agriculture (Animal Husbandry) acted for the Director of Agriculture for a period of four months during the latter's absence from the Island. This is the first time that a Veterinary Surgeon has been the head of the Ceylon Agricultural Department. We record the distinction that befell Mr. Crawford with much pleasure.

Professional Papers

The following members of the Association contributed articles of professional interest to the journals and magazines stated below :—

- M. Crawford — (1) 'Coconut poonac as a Food for Livestock'—*Tropical Agriculturist*—Ceylon.
 (2) 'The Polonnaruwa Farm'—*Daily News* Cattle supplement 1940.

- (3) "Should Cross Bred Bulls be used for Breeding"?
"Daily News" Cattle Supplement 1941.
- T.M.Z. Mahamooth—(1) "Artificial Insemination in Ceylon"—*"Tropical Agriculturist,"*—Ceylon.
 (2) "The Domestication of Farm Animals"—*"Journal of the School of Agriculture,"* Peradeniya.
- L. Rupesinghe — (1) "Clean Milk and How to produce it"—*"Anti Communist."*
- C. P. Pillai — (1) "The Veterinary Profession"—*"Journal of the School of Agriculture,"*—Peradeniya.
- J. C. A. Prins — (1) "The Veterinary Surgeon and Public Health"—*"Indian Veterinary Journal"* Madras.
- E. P. A. Fernando—(1) "A Successful Experiment in Hatching Eggs imported by Air Mail"—*"Tropical Agriculturist"* Ceylon.
- K. Thuraisingham—(1) "Gapes in Poultry"—*"Tropical Agriculturist."* Ceylon.
- L. A. P. Babapulle — "A Questionnaire on Rabies"—*"Times of eylon."*
 (2) "Milk"—*Social Justice.*
 (3) "Minerals in poultry Foods"—*"Journal of the Poultry Club."*—Ceylon.
 (4) "Milk Products"—*Social Justice.*
 (5) "Pasteurisation"—*Social Justice.*
- C. S. Leukay — "Farming in Denmark"—*Dinamina Cattle Supplement of 1941.*
- Hector C. Perera — "Amrita Mahal Cattle" in the *"Sunday Hindu,"* Madras.
 (2) "Rabies Menace"—*"Ceylon Daily News"*.
 (3) "Food Value of Milk"—*"Citizen," Journal of Colombo Municipal Service Union.*
 (4) "The Veterinary Serum Institute" Bangalore—*"Sunday Observer."*
 (5) "Indigenous Drugs in the Treatment of Livestock"—*"Indian Veterinary Journal,"* Madras.
 (6) "Dehorning of Cattle."—*"Ceylon Daily News" Cattle Supplement* 1941.
 (7) "Coconut Poonac as a food for Cattle"—*"Journal of Coconut Industreis,"*—Ceylon.

Rabies

One of the first questions that engaged the attention of your Committee was the problem of Rabies. Various methods were suggested to tackle the menace, from the raising and lowering of the dog tax, to the compulsory inoculation of dogs.

In view of the success that has attended the "one shot" method of prophylactic inoculation of dogs in other countries your Committee suggested that the Colombo Municipality should introduce this method as an experimental measure in the following resolution which was submitted to the Council.

"In view of the serious outbreak of Rabies in the City, the Committee of the Ceylon Veterinary Association request the Colombo Municipal Council to introduce immediately compulsory inoculation of all dogs in the City and urge that inoculation be given free of charge so that the full co-operation of the public may be ensured."

Proposed by Mr. D. Seneviratne.

Seconded by Mr. J. C. A. Prins.

It is the hope of your Committee that members of the Association will do their best with whatever means at their disposal to educate the public in this important Public Health problem. The world over Veterinary Surgeons are carrying on a ceaseless crusade against this scourge of humanity. It is their bounden duty to contribute their share to eradicate this most terrible disease.

Lecture

In the drive against Rabies launched by the profession — the first public lecture organised by the Association took place on the 16th of December 1940. Dr. L. Nicholls, Director of the Bacteriological Institute, delivered a very interesting and instructive lecture on "Rabies." The lecture was largely attended, those present including the Professors of the Medical and University Colleges. The Mayor of Colombo, Mr. A. E. Goonesinghe presided.

Assistance in case of Emergency

With a view of assisting the Government and the public in the event of an emergency arising from the war the following resolution was passed by your Committee :— "The Committee of the Ceylon Veterinary Association have much pleasure in placing at the disposal of the Government, in the event of an emergency, their professional services which might be needed

in any scheme of food inspection or in any scheme to safeguard the livestock of the country."

Proposed by Mr. J. Habaragoda

Seconded by Mr. L. P. P. Goonetilleke.

The above resolution was forwarded to the Minister of Agriculture and Lands and acknowledged with thanks.

Cattle Breeding

Your Committee discussed at length the important part Veterinary Surgeons could play in any scheme of livestock improvement.

After a full discussion the following resolution on cattle breeding was passed :—

"In view of the growing demand for better cattle in the country and in the interests of better cattle breeding, the Committee of the Ceylon Veterinary Association appeals, to Government to introduce at an early date legislation to enforce the registration of all stud bulls in the country."

Proposed by Mr. Hector C. Perera

Seconded by Mr. T. M. Z. Mahamooth.

The above resolution was forwarded both to the Minister of Agriculture and the Cattle Breeders Association of Ceylon and acknowledged

Indigenous Drugs

Another matter that engaged the attention of your Committee was the question of Indigenous drugs in the treatment of livestock. With a view to formulate a workable scheme a sub-committee consisting of Messrs. J. Habaragoda, C. W. Pate, and Hector C. Perera was appointed to go into the matter.

Meat Inspection

This was another subject that was discussed by your Committee. Meat inspection has never received the attention it deserves from public health bodies. The deplorable state under which animals are slaughtered in certain parts of the country was viewed with deep concern. The President promised to draw up a scheme to be discussed at a future date by your Committee after which representations are to be made to Government for better meat inspection throughout the country. To-day proper meat inspection is carried out only in Colombo, Kandy and Nuwera Eliya.

S. P. C. A. and Cruelty Cases

It was the opinion of your Committee that the S. P. C. A. Hospital should be run by the Colombo Municipal Veterinary Department. It was also suggested that the Colombo Municipal Veterinary Surgeon be vested with magisterial power like those of the Principal of the Bombay Veterinary College, to try cruelty cases. By this it was thought that both the animal and its owner who is being prosecuted for cruelty, will have a fair and square deal.

More Veterinary Surgeons

Your Committee heartily endorse the plea for more Veterinary Surgeons made by the Director of Agriculture in the course of his articles to the "Ceylon Daily News" Cattle Supplement of 1941. "The States Veterinary Services must be considerably enlarged — at least to the Mysore level, as the country begins to show a desire for a higher standard of cattle breeding" says Mr. Edmund Rodrigo, Director of Agriculture.

There cannot be progress in agriculture without an efficient Island-wide Veterinary Service. The policy of retrenchment adopted by Government in regard to veterinary facilities is greatly to be deplored for it is not merely unwise and uneconomic but is definitely harmful to the country.

Appreciation

Your Committee wishes to place on record the valuable services rendered to the Association by its President and Mrs R. J. Little. Not only did Mr. and Mrs. Little allow the Committee the hospitality of their bungalow for several informal meetings but the President assisted the Association financially several times. Your Committee is very grateful to him and Mrs. Little for their generosity.

The keen interest shown by Messers. T. M. Z. Mahamooth and D. Seneviratne Municipal Veterinary Surgeon Kandy, is also appreciated by your Committee.

Your Committee also wishes to record the excellent work done by the Hony. Treasurer Mr. L. A. P. Babapulle. Not only was he responsible in collecting all the subscriptions, for which he had to go out of Colombo several times at his own expense, but he was of great assistance to the Committee in several ways.

Our thanks are also due to Mr. E. M. C. Babapulle B. Sc., A. C. A., Chartered Accountant for auditing our books free.

It is also with pleasure we convey our thanks to Mr. T. Crofton-Slegh a well wisher of the Association for having kindly drawn our crest.

Finally your Committee wishes to thank the local press and Dr. Srinivasa Rao, Editor of the Indian Veterinary Journal, for kindly giving the widest publicity to the activities of the Association.

No. 29, Frankfort Place,
Bambalapitiya,
Colombo.

HECTOR C. PERERA,
Hony. Secretary.

REPORT OF THE HONORARY TREASURER

Our financial year started on the 28th of July 1940, but for purposes of accounting it was assumed as having had its inception on the first of April. Subscriptions poured in apace and it was certainly an arduous task to get off the receipts in time.

We sincerely thank those members who were spirited enough to send us their subscriptions in advance, some for as long as three years prior to their being due. To their goodwill in implying the long and continued advancement of our Association we are truly grateful. With encouraging co-operation of so generous a nature the work of the Treasurer was indeed pleasant. Some members, unfortunately, were rather tardy in sending their dues, but I am glad to say that in almost every case a reminder was all that was necessary to elicit response. We must impress on our members that sending reminders mean utilisation of funds which could be better employed, and more profitably so, to the Association's progress. Every one of the forty five Veterinary Surgeons on our books has paid for this year under review.

For your kindness in the past, and for your continued support in the future, we express our thanks.

Abiglen,
Colombo.

L. A. P. BRITO-BABAPULLE,
Hon. Treasurer, C. V. A. 1940/41.

CEYLON VETERINARY ASSOCIATION**Income and Expenditure Account**

(For the period 1st April 1940 to 31st March 1941.)

1941		1941	
March 31	To Postage	8-51	March 31 By Subs-
" "	Stationery	53-25	criptions 220-50
" "	Advertising	40-00	" Donations 2-50
" "	Transfer to		
	B/s, Excess		
	of Income		
	over Expen-		
	diture.	120-74	
		<u>222-50</u>	<u>222-50</u>

Extracts

A SIMPLE AND PRACTICAL TEST FOR THE DIAGNOSIS OF OSTEOPOROSIS IN HORSES

BY

V. D. RATNAM, G.M., V.C.,

Veterinary Assistant Surgeon on Glanders Duty, Madras

(Received for publication on 27 June 1939)

The test was first invented by Dr. Akio Iizuko of Japan and subsequently tried by A. K. Gomus and Arcadio, C. Gonzaga, College of Veterinary Science, University of the Philippines. After seeing the article by the above-mentioned Philippine authors in the *Journal of American Veterinary Medical Association* for October 1938, the writer of this article tested 70 horses in H. E. the Governor's Bodyguard of Madras during the month of January 1939. As a result, he was able to detect 22 cases of Osteoporosis in an early and incipient stage of the disease without any clinical manifestations and also confirmed one advanced case of Osteoporosis showing clinical symptoms. The author of this article made an instrument consisting of a pointed iron needle measuring about 2 mm. in diameter and 2 cm. in length mounted on a wooden handle measuring about four inches in length with a diameter of $\frac{3}{4}$ inch. The test is applied by inserting the pointed needle with a steady and moderate pressure into the region over the frontal sinus. The proper point for inserting is near the middle of an



Fig. 1. Test for Osteoporosis



Fig. 2. Test for Osteoporosis

imaginary line drawn connecting the inner canthi of the eyes. If the case is a positive one, the needle can be inserted into the bone easily; the animal keeps quiet without showing any symptoms of pain and the needle with its wooden handle stands perpendicular to the face as shown in Fig. 1. In negative cases, the needle cannot be inserted into the bone and the needle simply hangs on to the skin as shown in Fig. 2. The test should be applied on the left side of the median line but not on the right side, as it gives, at times, negative results even though the horse may be positive for Osteoporosis. The degree of softness of the bone can be very safely divided into two classes as (1) soft, (2) very soft. Out of 22 positive cases detected by this test, one was in advanced stage, showing clinical symptoms of Osteoporosis, while the other 21 horses did not show any clinical symptoms of Osteoporosis. Most of them, however, had been lame for some complaint or other. As recommended in the *Journal of American Veterinary Medical Association*, these positive cases were treated with one table-spoonful of calcium carbonate daily in feed for nearly two months. Along with this treatment, the Philippine authors recommend the subcutaneous and intravenous injections of colloidal magnesium hydrate 1 per cent solution from 50 to 100 c.c. to help the retention of calcium in the bones and to hasten the recovery. As this drug was not available anywhere in India, only calcium carbonate was tried for two months and then the animals which had given a positive test before were retested after two months. Ten cases gave complete negative results and in the remaining 12, the bone was not so very soft as it was before the treatment. These horses were aged and it was thought the absorption of calcium was very slow. The calcium treatment is therefore being continued for another two months for further observation. All the four young remounts gave negative test after the treatment. This shows that in young horses the recovery is quicker than in older ones.

CONCLUSION

It is the opinion of the writer of this article that Osteoporosis is fairly common in horses in Madras and that a horse should be tested at least twice or thrice in a year so that the disease can be detected in its early stage and treated successfully. The test is based upon the observation that the bones of the skull, particularly the frontal bones, are the parts of the skeleton which are affected first. This simple test is harmless and can be very easily performed periodically on all horses in a stable to pick out animals which are in need of calcium treatment. This will arrest further progress of the disease.

I. J. V. S and A. H. Vol X, No 1., 1940

The Immunizing Value of the Blood Clot of Hyperimmunized Animals

When an animal is bled and the serum is allowed to decant the proportion of serum obtained varies between 40 and 50 per cent according to the species of animal and the method of separating it. The clot contains red and white blood cells and also a certain quantity of serum that may be worth considering. Moreover, relatively recent experiments have shown that the red cells possess the property of absorbing virus, bacteria and antigens circulating in the blood¹. In the attempt to obtain more of the

specific serum against canine distemper (Carre's disease) the authors tried to verify in the cadre of that disease, the power the red cells have in absorbing the specific antibodies.

Recently two Russian authors, P. A. Boulanov and V. Rikowsky, assuming that the body has the capacity of producing antibodies only through cells of mesoblastic origin and that it is possible that they (antibodies) formed in the figures elements of the blood as well as in other cells of the same origin, attempted to obtain a liquid from the blood cells possessing the properties of antiserum and capable of replacing it. To obtain this liquid the authors used the blood of horses hyperimmunized against anthrax. The blood of these animals was kept in flasks at room temperature until separation of the serum was complete. The serum was then aspirated and mixed with 3 per cent phenol. The coagulum remaining was shaken energetically for 15 minutes in the same flasks whereupon physiological salt solution was added. To facilitate extraction the flasks were left at room temperature for 24 hours, filtered through gauze and Berkefeld bougie, and conserved like serum with a solution of 3 per cent phenol.

The titration was effected on rabbits. The authors concluded:—

1. The blood clots prepared from the blood of an animal immunized against anthrax possesses immunizing properties;
2. the liquid is no less active than the serum;
3. the preparation of such a liquid reduces the production expense and augments the amount produced.

Based upon these experiments, the authors attempted to obtain from red blood cells (which are thrown away in the preparation of specific serums), an immunizing liquid against canine distemper.

Preparation of the Extract.—Dogs hyperimmunized in the usual manner were used. The serum was collected by decantation. The clot remaining in the flask was mixed with physiological salt solution amounting to one half of the quantity of the serum removed. The mixture was energetically stirred and shaken and left 24 hours in the refrigerator. This liquid obtained by centrifuging is limpid red. It was then formulated (1%) and incubated at 56°C. for two days.

Titration on Ferrets.—One ferret resisted 1 mg. of virus after receiving 1 mg. of the blood-cell extract; 1 ferret died of 10 mg. of virus after receiving 1 cc. of the extract; 1 ferret resisted 10 mg. of virus after receiving 2 cc. of the extract; 1 ferret resisted 2 mg. of the virus after receiving 1 cc. of the extract; and 1 ferret died of 2 mg. of virus after receiving 1 cc. of the extract.

As is customary in the titration of specific serums the doses in these experiments were 1,000 to 10,000 times the minimum mortal doses. The results were, therefore, excellent.

The Practical Results.—Tests of the therapeutic value of such products have been made on dogs affected with the natural disease, at the Alfort clinic, during the months of September and October, 1936. Symptomatic

treatment, except in several cases, was not neglected. The dose of the red-cell extract was 20 cc. : 10 cc. subcutaneously and 10 cc. intramuscularly at the thigh. The animals were examined two to three days after receiving the injection and the results checked again after a month or two.

(The authors tabulate the result in 23 cases).

Of 23 cases treated 16 recovered and 7 died. Of the latter 2 were sacrificed before the results could be judged. Of the 16 recoveries, two were rapid and occurred without any symptomatic medication. In general when employed early, the extract provoked early amelioration. The authors do not claim that the blood-cell extract is superior or even quite as effective as the serum-alone product.

Journal of the AVMA., February, 1941.

Stiff Lamb Disease (Aphosphorosis).

Since pronounced similarity was observed in the appearance of the skeletal muscles in stiff lamb disease and the same entity in calves, affected lambs were treated with phosphoric acid. In stiff calf disease, blood samples from the dams (cows) showed inorganic phosphorus deficiency, and the calves exhibited stiffness, muscular weakness, paresis and emaciation, with death ensuing. *Post mortem* the skeletal muscles were pale, pinkish gray. When bone meal was fed to the cows and phosphoric acid to the calves, there were no further losses.

Stiff lamb disease was studied in a flock of 20 ewes, purchased in poor condition in the fall and wintered on hay and mangels with grain ration fed two weeks before lambing. The lambs were 3 weeks old when the flock was turned to pasture. In three or four days several of the lambs were stiff and in a week twelve were affected.

Given a desertspoonful of dilute phosphoric acid twice a day for three days and then a teaspoonful twice a day for the remainder of the week, the lambs recovered in two weeks. One lamb badly stricken died of pneumonia after showing some improvement in locomotion.

Blood samples of the ewes showed that the phosphorus content ranged from 3.57 to 6.80 mg. per cent and of the lambs 5.88 to 9.0 mg. per cent. (F. W. Schofield and A. F. Bain. Stiff Lamb Disease—An Aphosphorosis. Report of the Ontario Veterinary College, 1939, p. 19).

Journal of the AVMA., February 1941.

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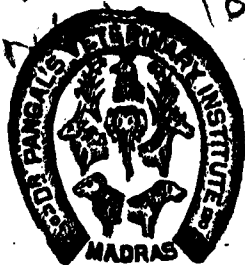
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