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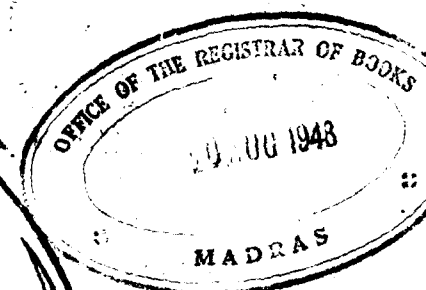
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(The Journal of the All-India Veterinary Association)



Editor :

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

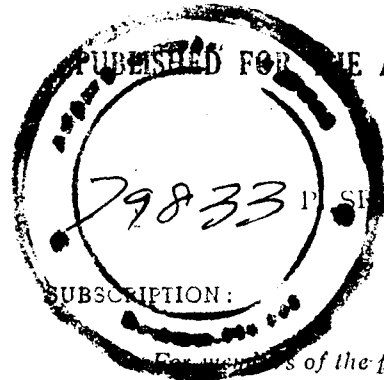
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NOTICE

The Indian Veterinary Journal

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Devoted to the Cause of Veterinary Profession.



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

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THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XXIV

MAY, 1948

No. 6

General Articles

ON THE USE OF TISSUE-FREE MEDIA FOR THE PREPARATION OF BLACKQUARTER VACCINE:

- (I) CYSTEINE HYDROCHLORIDE BROTH:
- (II) ACID DIGEST OF LIVER AND MEAT*

By

V. R. RAJAGOPALAN

Imperial Veterinary Research Institute, Mukteswar-Kunnon, India

Immunisation against blackquarter with preparations of spore cultures in the form of dried and heated muscle pulp from an infected calf, and with natural and artificial aggressins, has given place in recent years to immunisation with formalin-treated cultures. This method, first introduced by Leclainche and Vallee (1925), and advocated by M'Ewen (1926), Karmann (1927) and others, has become the standard method of immunisation against the disease in many parts of the world. The immunity established is both antibacterial and antitoxic and is far superior to that established by means of natural or artificial aggressins.

To ensure massive growths for the purpose, use has been made of glucose broth containing pieces of autoclaved meat, pieces of sterile tissue or heart muscle of an inoculated guinea-pig (Cordier, 1926). These methods have the disadvantage that particles of the tissue used for creating anaerobiosis become mixed with the bacterial suspension. M'Ewen used diffusion shells containing minced liver in conical flasks of sucrose broth, and Sheather (1928) replaced the diffusion shells by porous Porcelain cells. Among methods for preparing tissue-containing media, M'Ewen's procedure and Sheather's modification of it are the best for obtaining growth free from tissue particles. Among methods dispensing with the use of tissues, the catalytic device of McIntosh and Fildes (1916) is efficient with agar slants and plates and with small volumes of liquid media, but it is less useful for bulk preparation of vaccine. The central catalysing plant advocated by Boéz (1927) for growing anaerobes in a series of containers may be more useful for this purpose. Certain chemical substances have also been used

*Reprinted from the Journal of Pathology and Bacteriology Vol. LIX, Nos. 1 and 2 pp. 37-50, 1947.

to replace animal tissues in producing anaerobiosis. Reduced iron (Scott and Brandly, 1933), sodium hydrosulphite (Aristowsky and Minkewitsch; 1934-35) and levulinic acid all have reducing action. Certain substances containing a sulphhydryl group, such as cysteine, glutathione and thioglycolic acid, are also powerful reducing agents. Ehrismann (1936) showed that ascorbic acid (vitamin C) can bring about growth of anaerobes.

But the literature dealing with chemical reducing agents in the growth of anaerobes is mainly academic. Except perhaps for sodium thioglycolate (Brewer, 1940) chemical reducing agents have not been used extensively for routine cultivation of anaerobes or bulk production of anaerobe vaccines.

Part I. Cysteine Hydrochloride Broth

Hosoya (1925, quoted by Frei and Hall, 1931) demonstrated the use of cysteine for growth of anaerobes, and Frei and Riedmüller (1930-31) and Frei and Hall have grown anaerobes in solid and liquid media containing 0.3 per cent. cysteine hydrochloride. This medium is successful because the—SH group in cysteine has reducing properties capable of yielding a high reduction potential uninfluenced by the presence of its oxidised -S-S-form. The experiments described in this section concern the use of cysteine as reducing agent in media for routine production of blackquarter vaccine.

METHODS

Relatively high concentrations of cysteine hydrochloride render broth very acid and also turbid. A 12.5 per cent. solution of cysteine hydrochloride is neutralised by an equal volume of N.NaOH and the turbidity also disappears. For convenience, a solution of cysteine hydrochloride of known strength was sterilised by candle filtration and kept in a Melatosh and Fildes's jar under anaerobic conditions for addition to media as required. Such a solution retains its full reducing properties for a long period. Normal solution of sodium hydroxide are usually sterile a few days after preparation, but such solutions were usually autoclaved and sealed with paraffined plugs. To prepare the medium, the cysteine solution and an equivalent quantity of NaOH were added to the broth. Sometimes a mixture of equivalent proportions of cysteine hydrochloride and NaOH solutions was added to media, the two solutions being autoclaved before or after mixing. Frequently, the required percentage of cysteine hydrochloride was added to broth, which was then adjusted to the required pH by addition of NaOH as usual and finally sterilised by heat.

EXPERIMENTAL RESULTS

Concentration of cysteine hydrochloride for growth of *Cl. chauvoei*

Expt. 1. Nine c.c. amount of 1.0 per cent. glucose broth containing 0.05, 0.02, 0.01, 0.005, 0.002 and 0.001 per cent. respectively of cysteine hydrochloride were tubed. Duplicate tubes had a layer of paraffin. Two strains of *Cl. chauvoei* were used as seed, namely no. 14, an avirulent, and no. 26, a virulent strain, one drop of meat culture being seeded to each tube. Growth was read at 24 hours (table I).

Expt. 2. Cysteine hydrochloride was added to broth, with or without glucose, to final concentrations of 0.01, 0.025, 0.05 and 0.075 per

cent. The pH was adjusted to 7.0. Ten-c.c. quantities of the media were sterilised at 120° C. for half-an-hour. When cooled to room temperature, they were seeded with one drop of 18-hour meat culture. Three strains of *Cl. chauvoei* and one strain of *Cl. septicum* were used; readings were made after 24 hours (table II).

TABLE I

Minimal effective concentration of cysteine hydrochloride in glucose broth for growth of *Cl. chauvoei*

Strain	Final concentration of cysteine hydrochloride (per cent)* Cysteine neutralised									
	before sterilisation					after sterilisation				
	0.05	0.02	0.01	0.005	0.002	0.05	0.02	0.01	0.005	0.002
14 (P)	+	—	—	—	—	+	+	—	—	—
26 (P)	+	+	+	+	—	+	+	+	+	—

+ = growth; — = no growth.

In series (P) the medium was covered by liquid paraffin.

* The sterilised cysteine was added to sterile medium in the final stage.

TABLE II

Minimal effective concentration of cysteine hydrochloride in broth and glucose broth

Strain	Final concentration of cysteine hydrochloride (per cent.)			
	0.075	0.05	0.025	0.01
<i>chauvoei</i> 44 . . . (G)	+	±	—	—
" 45 . . . (G)	+	+	—	—
" 26 . . . (G)	+	+	±	—
<i>septicum</i> . . . (G)	+	+	±	—

+ = profuse growth ± = moderate growth.

In series (G) the broth contained 1.0 per cent. glucose.

Expt. 3. To ascertain if growth was proportional to the amount of cysteine added, the growth was quantitatively estimated. Thirty-five-c.c. quantities of ordinary broth and of 0.5 per cent. glucose broth

containing different concentrations of cysteine hydrochloride were made. The pH was adjusted (in most cases) to 6.8. Tubes were sterilised at 120° C. for half-an-hour and sown with 0.5 c.c. of meat culture of *Cl. chauvoei* 44 soon after cooling. The quantity of growth after 48 hours was ascertained by weighing the centrifuged dried deposit (table III).

TABLE III

Amount of growth in relation to concentration of cysteine hydrochloride

Medium	Concentration of cysteine hydrochloride (per cent.)				
	0.2	0.1	0.05	0.025	0.0125
Broth pH 6.8	7.5	4.3	3.9 (2.4, 2.2)	5.8	1.6
0.5 per cent. glucose broth pH 6.8	14.4	18.7	17.1 (14.3, 14.1)	16.7	15.5

Figures show dry weight of bacterial substance in mg.

Figures in brackets show dry weight of bacterial substance when the pH was 7.2 and 7.8 respectively.

With the inoculum used, the least concentration of cysteine hydrochloride which could be relied upon to support growth of *Cl. chauvoei* under aerobic conditions was 0.05 per cent. With increasing concentrations of cysteine the resulting growth was greater, but with added glucose, within the ranges tried, the concentration of cysteine hydrochloride made no difference to the quantity of the final growth.

Optimum pH of cysteine hydrochloride broth

Broth containing cysteine hydrochloride at 0.05 and 0.075 per cent. was set at different levels of pH. The medium was autoclaved and used fresh. Media with a pH of over 7.2 usually showed a deposit of phosphates. If this happened, every lot of medium in that experiment

TABLE IV

Optimum pH for growth of *Cl. chauvoei* in 0.075 per cent. cysteine hydrochloride broth

Strain	pH 6.0	6.2	6.6	7.4	7.6	8.0
44	++	++	++	+	+	tr
45	++	++	+++	+	+	tr
26	++	++	++	++	+	tr
20	+	++	+	+	tr	tr
12	++	++	++	++	+	+

Growth estimated by visual examination after 8 hours at 37° C.; tr, etc. = degrees of growth.

was filtered and autoclaved a second time before being seeded from a 24-hour meat culture of one or more strains of *Cl. chauvoei*. The degree of growth was judged either by opacity after a short incubation or by weighing the dried centrifuged deposit, usually after a longer incubation. Sample results in tables IV-VI show that the most favourable pH for *Cl. chauvoei* is about 6.8. However, it was found

TABLE V

Optimum pH of 0.05 per cent. cysteine hydrochloride broth autoclaved at 120° C. for half-an-hour

Initial pH of medium	6.2	6.6	7.2	7.4	7.7
Visual examination	+	+++	++	+	—
Nephelometer reading	5.36	15.0	3.0	1.5	1.0
Dry wt. (mg.) from 20 c.c. culture	1.5	4.0	0.9	0.4	0.3
Final pH of medium	6.1	6.5	7.0	7.4	7.7

Readings after 12 hours at 37° C.

— = no growth; +, ++, +++ = increasing degrees of growth.

TABLE VI

Optimum pH for growth of *Cl. chauvoei* in 0.05 per cent. cysteine hydrochloride media

Broth	pH 6.3 11.0	6.6 17.9	6.8 15.2	7.1 13.6	7.5 13.3
Glucose broth	pH 6.2 45.2	6.4 45.5	6.6 42.0	6.8 60.5	7.0 65.8

Figures show dry weight in mg. of bacteria obtained after 48 hours at 37° C. from 120 c.c. of culture.

in earlier experiments that growth will take place even in extreme alkaline ranges in a sterile medium containing an excess of cysteine hydrochloride (0.3 per cent.) to which glucose is subsequently added.

Effect of different grades of heat on cysteine hydrochloride in broth. Frei and Hall stress the need to avoid changes in the composition of the cysteine through overheating. The effect of the following temperatures was tried: no heating, 100° 105° and 120° C.

A 5 per cent. solution in water of cysteine hydrochloride at pH 6.8 was sterilised by filtration and 0.4 c.c. amounts were added to each of four 39.6 c.c. quantities of broth at pH 6.8 to yield a final concentration of 0.05 per cent. The first lot was

unheated and the other three were heated at 100°, 105° and 120° C. for one hour, 30 minutes and 30 minutes respectively. When cool, each lot was seeded with 0.25 c.c. of supernatant of a meat culture of *Cl. chauvoei*. After 48 hours' incubation growth was ascertained as dry weight of bacterial substance (table VII).

TABLE VII

Amount of growth of *Cl. chauvoei* in relation to temperature of sterilisation.

Sterilisation by			
filtration	100° C. for one hour	105° C. for 30 mins	120° C. for 30 mins.
5.9	4.0	5.8	4.7

Figures show weight in mg. of dry bacterial substance from 40 c.c. cysteine medium after 48 hours at 37° C.

Growth in the different lots was about the same and within the range of possible experimental error. Heating had no detrimental effects on cysteine under the conditions of the experiment.

Effect of heat on cysteine hydrochloride in broth at different H-ion concentrations. It was desired to ascertain if the selective pH range about 6.8 was an expression of optimal requirements or was due to loss of reducing property of cysteine hydrochloride when heated at other ranges of pH. Twenty-five-c.c. lots of 0.06 per cent. cysteine hydrochloride broth were adjusted to pH 3, 4, 5, 6, 7, 8 and 9 respectively. On heating at 118° C. for half-an-hour, media at pH 3, 4, 8 and 9 became turbid, those at 5, 6 and 7 remained clear. The pH of every lot was now adjusted to 7 by adding requisite quantities of HCl or NaOH. On neutralisation, media originally at pH 8 and 9 cleared; those at 3 and 4 still remained slightly opalescent. The media were again heated at 118° C. for half-an-hour and after cooling sown with 0.2 c.c. of an 18-hour meat culture of *Cl. chauvoei*. There was growth of the same degree in all the tubes 14 hours later. Thus under the experimental conditions cysteine hydrochloride did not lose its reducing power when heated at different pH levels.

Addition of glucose. Broth containing 0.05 per cent. cysteine hydrochloride was adjusted to pH 6.8 and glucose was added to 35-c.c. quantities to give concentrations of 0.0, 0.5, 1.0 and 2.0 per cent. respectively; the media were heated at 120° C. for half-an-hour and growth of *Cl. chauvoei* at 48 hours was estimated as dry weight of bacterial substance (table VIII). There was a threefold increase in growth when 0.5 per cent. glucose was

TABLE VIII

Addition of glucose to 0.05 per cent. cysteine hydrochloride broth, pH 6.8

Added glucose (per cent.)			
nil	0.5	1.0	2.0
6.5	18.7	18.5	19.0

Figures show weight in mg. of dry bacterial substance from 35 c.c. culture after 48 hours at 37° C.

added. Higher concentrations of glucose did not increase growth. The final pH in all lots containing glucose was 5.3, indicating that growth of *Cl. chauvoei* ceased at this pH without further utilisation of glucose. Fractional addition of alkali during incubation might of course promote continued growth.

Keeping quality of cysteine hydrochloride broth. Three 200-c.c. lots of broth were filled into conical flasks and heated at 120° C. for half-an-hour. The first lot contained 0.05 per cent. cysteine hydrochloride, the second 0.5 per cent. glucose, and the third both reagents in the concentrations stated: the pH was 6.8 and the flasks were left in the incubator until required. The longest time after its preparation that the medium will support growth of *Cl. chauvoei* was noted in four experiments.

Cysteine broth alone supported growth only if used fresh. With glucose added, it was useful for 24 and sometimes 48 hours. With added cysteine and glucose, the stored broth could be regenerated up to at least 5 days by heating it at 120° C. for half-an-hour immediately before use. Broth containing glucose alone never supported growth. It is interesting that glucose, which by itself could not support growth, could augment the growth value (tables III, VI and VIII) as well as the keeping quality of cysteine media.

Potency of anaculture and toxoid prepared by mixing cysteine hydrochloride cultures of *Cl. chauvoei* and *Cl. septicum*

As a medium for anaculture, 0.05 per cent. cysteine hydrochloride in 0.5 per cent. glucose broth was adjusted to pH 6.8 and heated at 120° C. for half-an-hour. In preparing anaculture at this Institute it has been the practice to mix 2-day and 14-day Noguchi cultures of *Cl. chauvoei* (two strains) and *Cl. septicum* (two strains) with the intention that the product should be polyvalent, antibacterial and antitoxic.

Proceeding in the same way with the experimental glucose-cysteine medium, it was desired to ascertain: (a) if there was any difference in the potency of the product from 2- and 14-day growths, and (b) if a layer of paraffin would alter the potency of the products. In both cases, at the stated times, formalin was added to a concentration of 0.3 per cent. and the cultures were left at 37° C. for a further 24 hours. The same four strains were used so that the cysteine medium might be compared with the routine Noguchi medium. After incubation for the stated times, portions of the formalised product were filtered to constitute toxoids.

Two hill bulls and one guinea-pig were vaccinated with each product, the doses being 5.0 c.c. for bulls and 2.0 c.c. for guinea-pigs. After 14 days, the animals were tested with a mixture of the four strains, bulls being given 50 m.l.d. and guinea-pigs 300 m.l.d. (table IX).

TABLE IX

Protective value of *Cl. chauvoei* and *Cl. septicum* anacultures and toxoids from cysteine hydrochloride glucose broth

Vaccine	Days grown	Paraffin layer	Bulls (50 m.l.d.)	Guinea-pigs	
				(300 m.l.d.)*	(50 m.l.d.)
Anaculture . . .	2	Yes	0/2	2/2	0/2
Toxoid . . .	2	"	1/2	2/2	0/2
Anaculture . . .	2	No	0/2	2/2	0/2
Toxoid . . .	2	"	0/2	2/2	0/2
Anaculture . . .	14	Yes	0/2	2/2	0/2
Toxoid . . .	14	"	0/2	2/2	0/2
Anaculture . . .	14	No	0/2	2/2	0/2
Toxoid . . .	14	"	0/2	2/2	0/2
Unvaccinated . .	...	...	2/2	2/2	2/2

Numerator = no. died.

Denominator = no. tested.

* All vaccinated guinea-pigs tested with 300 m.l.d. survived for more than 28 hours whereas both unvaccinated controls tested with the same dose died in less than 14 hours.

Both anacultures and toxoids were found to be safe for the experimental animals. Potency tests in bulls showed that the anacultures and toxoids were equally efficacious, except possibly the toxoid from the two-day culture under paraffin. Fifteen of the 16 vaccinated bulls survived, while two control bulls died. In guinea-pigs, the results with 300 m.l.d. were uniformly bad, probably because this dose of test culture was too large. But whereas the control guinea-pigs died within 14 hours, all the vaccinated lived beyond 28 hours, suggesting a certain degree of protection. The test in guinea-pigs was therefore repeated, each animal receiving 2.0 c.c. of the product, which was followed in 14 days by a test dose of about 30 m.l.d. The result (table IX, last column) supports the finding for bulls and shows that the anacultures and filtrates were equally efficacious in protecting guinea-pigs against infection with certainly lethal doses of test culture. In our experience, natural aggressins and toxoids of *Cl. chauvoei* alone are less useful.

Potency of Cl. chauvoei anaculture and toxoid prepared in cysteine hydrochloride broth

It was surmised that the immunising property of the toxoids in the last experiment was due to the *Cl. septicum* toxoid, because Mason (1936) has shown that this toxoid can protect sheep against lethal doses of

Cl. chauvoei. It was considered advisable, therefore, to test whether in cysteine medium sown with *chauvoei* sufficient toxin would be formed to produce a toxoid protecting against *chauvoei*.

Cysteine hydrochloride glucose broth as used in the last experiment was put up in three conical flasks in 50-c.c. quantities. As soon as the medium had cooled to room temperature, each flask was sown with 1.0 c.c. of a 24 hour meat culture of a virulent strain of *Cl. chauvoei*. One flask was formalised (0.3 per cent.) after two days' incubation and another after 14 days. After addition of formalin, the flasks were left at 37°C. for a further 24 hours. A portion of the contents of each flask was then filtered through a Berkefeld-N candle. A third flask sown with a heavy inoculum was formalised after 12 hours' growth in order to ascertain if there was any virtue in using a young culture, as with certain other bacterial vaccines. Groups of 8-16 guinea-pigs were given 1.0 c.c. of anaculture or 3.0 c.c. of toxoid. The animals were tested for immunity after 18 days with what was ascertained to be a lethal dose of calcium chloride suspension of washed spores of *Cl. chauvoei*. There was no significant difference in the mortality rates between the control group and the groups previously treated with filtrates; but the difference between the control group and the groups treated with anaculture was highly significant (table X). Thus *chauvoei* filtrates had no detectable protective properties. On the other hand, anacultures whether from 12 hours's, 2 days' or 14 days' growth were efficient immunising agents. This is in agreement with Henderson (1932), who showed that somatic antigens play the major part in *chauvoei* immunity. It is preferable, however, to use a 48-hour rather than a 12-hour culture, since growth is much more abundant at 48 hours.

TABLE X

Protective value of *Cl. chauvoei* anaculture and toxoid prepared from cysteine hydrochloride cultures incubated for varying times

Vaccine	Incubation for	Guinea-pigs
Anaculture . . .	12 hours	0/8
" . . .	2 days	0/16
" . . .	14 "	0/16
Toxoid . . .	2 "	4/8
" . . .	14 "	4/8
Unvaccinated . .	...	4/8

Numerator = no. died. Denominator = no. tested.

DISCUSSION

For manufacturing blackquarter vaccine, there are obvious advantages in the use of a cysteine medium: it is clear, it can be sterilised in the final stage and it involves no handling beyond that required for bottling.

It is advantageous to use a mixed *chauvoei* and *septicum* anaculture, because it confers greater immunity than anacultures of *Cl. chauvoei* alone. It is also an advantage that the same vaccine can be used for sheep, in which *Cl. septicum* plays a predominant role.

Cysteine hydrochloride is now sold in India at Rs. 150 per lb. At first sight it may appear that cysteine vaccine is more costly than that made from Noguchi medium, but on calculation and making all allowances this is found not to be the case.

SUMMARY OF PART I

(1) The lowest concentration of cysteine hydrochloride that could be relied upon for aerobic growth of *Cl. chauvoei* in broth in conical flasks was 0.05 per cent. Growth was improved by the addition of 0.5 per cent. glucose.

(2) The optimum pH was 6.8, though growth would also take place in a slightly alkaline medium. There was no growth in a medium more acid than pH 5.6.

(3) Growth was equally good whether the medium was sterilised by filtration or by heat at 100-120° C. The usefulness of the medium was not reduced by heat sterilisation within a pH range from 3 to 9, provided it was finally adjusted to about pH 6.8.

(4) Cysteine hydrochloride broth must be used fresh, but if glucose is also present the medium is suitable for growth within at least the first 24 hours after preparation. Also, cysteine broth containing glucose could be regenerated within at least five days of its preparation by heating for half-an-hour at 120° C. just before use.

(5) Anacultures of *Cl. chauvoei* prepared from cysteine hydrochloride glucose broth are equally potent whether collected from 12-hour, 2-day or 14-day cultures. It is preferable, however, to use cultures two days old. *Chauvoei* toxoid alone has no appreciable protective properties, but if mixed with *septicum* toxoid it confers a high degree of immunity.

(6) The following procedure for preparing blackquarter vaccine from cysteine hydrochloride broth is recommended. Broth containing 0.5 per cent. glucose and 0.05 per cent. cysteine hydrochloride is adjusted to pH 6.8, filled into conical flasks to near the neck, heated at 120° C. for half-an-hour and sown soon after cooling with a 1 per cent. inoculum of *Cl. chauvoei*

from an 18-hour meat culture. After 48 hours' incubation, an anaculture is prepared by the addition of formalin to a concentration of 0.5 per cent. and leaving the culture a further 24 hours at 37° C. It is preferable to add an equal volume of *septicum* anaculture prepared in the same manner.

Part II. Acid Digest of Liver and Meat

Less fastidious anaerobes such as *Cl. septicum* and *Cl. tetani* have been grown in relatively simple media such as glucose broth under a paraffin layer. It is well known that *Cl. chauvoei* will not grow in any such media.

It has been a general experience that by substituting liver extract for ordinary broth or pieces of liver for minced heart in Robertson's meat medium a more profuse growth of anaerobes is usually obtained. It was thought that this was perhaps due to the higher liver content of glycogen and perhaps of sulphur-containing proteins which may yield active -SH groups. But since a simple liver extract did not support growth of *Cl. chauvoei*, experiments were undertaken with liver digests. It was anticipated that some of the amino-acids released from the proteins by hydrolysis would contain sulphhydryl groups, which are known to be powerful reducing agents. Ox liver suspended in twice its weight of water was therefore subjected to digestion with a commercial pepsin at 56° C. for 5 hours at pH 2.0 and to tryptic digestion according to Hartley (1922). The media were finally set at pH 6.8, and it was found that *Cl. chauvoei* had grown in the peptic but not in the tryptic digest. At the same time, it was noticed that the liver particles in the peptic-digest flask were little disintegrated and it was found that the pepsin in use had become entirely inert; hence it was concluded that a simple acid digest of liver would be a good medium for growing *Cl. chauvoei*.

METHOD OF PREPARING THE ACID-DIGEST MEDIUM

One kg. of minced tissue, 2 litres of water and 80 c.c. of 10 N. hydrochloric acid were left to digest at the required temperature (56° or 100° C.) for the desired period. The vessel was then placed at room temperature overnight and next morning adjusted to pH 6.0 by the gradual addition of 10 N. alkali. This usually required about the same volume of alkali as of acid used for digestion. The pH was carefully checked during the addition of the last fifth of the alkali so that the pH should not go beyond 6.0. The medium was then steamed for 10 minutes and filtered through paper. The clear filtrate was adjusted to pH 6.6-6.8, distributed into conical flasks or large test-tubes (22 mm. diameter) as desired and steam-sterilised for an hour. The supernatant of an overnight meat culture serially diluted in saline was used for seeding.

Sometimes digestion was carried out with concentrated HCl. The minced tissue and concentrated acid (10 N.) were then well mixed, the water being added at the end of the stipulated period of digestion. The alkali required for neutralisation could be introduced with this water.

Experience showed that if the medium was not to be ruined certain precautions were necessary. Neutralisation of the acid must not be done while the digest is hot and the alkali should be added gradually, with shaking to ensure even mixing, either after or along with water. The pH should not be allowed to rise beyond 6.8.

Replacement of liver by muscle in the medium

As meat (muscle) may be more easily procured than liver, it was desired to ascertain how much of the liver could be replaced by meat without reducing the growth of *chauvoei*. A mince of liver and veal was put up in different proportions. Water and 10N.HCl were added as usual and after the suspensions had been left at laboratory temperature overnight as a matter of convenience, they were digested in the steamer at 93° C. for 5 hours. Media were prepared as described above from these digests and 35 c.c. amounts were put into large test-tubes, steamed and seeded with graded inocula (table XI).

TABLE XI

Replacement of liver by meat (muscle) in acid-digest medium

Seed (c.c.)	All liver	Proportion of liver to meat			All meat
		3:1	2:2	1:3	
1.0	16 ++++	16 ++++	16 ++++	16 ++++	16 +
0.1	20 ++++	20 ++++	20 ++++	16 ++	—
0.01	36 +±	36 +±	24 +++	24 +	—
0.001	—	—	36 +±	24 ±	—

— = no growth; ±, +, ++ etc. = increasing amount of growth.

Figures represent the time in hours at which growth was first seen.

Growth started first in the all-meat lot seeded with the largest inoculum; on inspection at 16 hours it was already bubbling gas while the others showed only turbidity. But this rapid growth came to an abrupt end and the final yield was the poorest of all the corresponding lots. At the other end, the lag period was relatively longer in media made from higher proportions of liver; and with the smallest inoculum no growth took place in them. The best medium was the one made from equal parts of liver and muscle.

Influence of concentration of acid, temperature and duration of digestion on the richness of the resulting medium

Digestion of mixtures of equal parts of liver and muscle mince was carried out at 56° or 93° C. in the presence of diluted or concentrated HCl for periods of 5 hours

or 5 days. The media were constituted on the following day or after standing at room temperature for 5 days. Apart from these variations, the routine method was followed. The media were put up in 35 c.c. quantities in large test-tubes. They were used soon after constitution or after an interval of 5 days; in the latter case the media were regenerated by steaming for half-an-hour just before use. Three serial tenfold dilutions of meat culture were used for seed. The cultures were inspected at convenient intervals to note when growth started. The final growth was estimated by the nephelometer (table XII).

The best medium was obtained by digestion of the tissues in the presence of undiluted HCl at 93° C. for 5 hours on a single day. It did not matter if the medium was constituted soon after digestion or after staying at room temperature for 5 days. This medium was capable of regeneration on the 5th day, but it could also be regenerated up to 15 days according to experiments not detailed here. In general, however, it is much better to use the medium as soon as it is constituted. Two other media also proved good: the 5-day concentrated acid digest at 56° C. and the 5-day diluted acid digest at 93° C.

Potency of vaccine made from liver-muscle acid digest

An anaculture was prepared from a two-day growth of *Cl. chauvoei* in acid-digest medium. The medium was prepared from equal parts of liver and meat digested in the presence of concentrated acid at 93° C. for 5 hours. Five bulls and five guinea-pigs were vaccinated, each with 5 c.c. and 1 c.c. respectively of the vaccine. Five weeks later they were tested, together with five controls of each species, with 50 lethal doses of calcium chloride suspension of *chauvoei* spores. All the vaccinated bulls and guinea-pigs survived, but of the controls four bulls and all five guinea-pigs died. The vaccine was potent.

DISCUSSION

It was thought that the value of the liver digest in supporting the growth of anaerobes possibly depended on the presence of reducing sugars or protein disintegration products containing active -SH groups. But the nitroprusside test failed to reveal the presence of active -SH groups and reducing sugars could not be demonstrated by the Benedict test. Ascorbic acid, which can induce anaerobiosis, was not detected by dichlorophenol-indophenol. But on addition of cysteine to the medium a substance capable of reducing dichlorophenol-indophenol was formed, cysteine alone being incapable of reducing dye. This might suggest the formation of ascorbic acid from dehydroascorbic acid by cysteine. Whatever the reducing substance it is inactivated by heat in the alkaline range, and ascorbic acid is also inactivated by heat in the alkaline range, and ascorbic acid is also inactivated under the same conditions. Further work is necessary before a valid explanation can be advanced how acid digests of liver support growth of anaerobes.

SUMMARY OF PART II

Cl. chauvoei was grown under aerobic conditions in a medium prepared from hydrochloric acid digest of ox liver. Growth was improved and the lag period reduced when half the liver mince exposed to digestion was replaced by muscle tissue. Five hours' digestion at 93° C. in the presence of concentrated acid was satisfactory; several days' digestion was required at 93° C. in the presence of diluted acid or at 56° C. in the presence of concentrated acid. After digestion, the pH on addition of sodium hydrate must not exceed 6.8.

The medium remained usable for about fifteen days provided it was regenerated by heat before use.

Grateful acknowledgement is made to Dr F. C. Minett for advice and help in writing this paper.

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TABLE XII—Value of acid-digest medium in relation to concentration of acid, temperature and duration of digestion

Acid	Temperature	Period (h=hours; d=days)	Constituted (days after digestion)	Used (days after constitution)	Growth with different quantities		
					0.01 c.c.	0.001 c.c.	0.0001 c.c.
Dilute	56° C.	5h	{ 1	{ 0	12	+	+
					12	+	+
		5d *	{ 5	{ 0	18	+	+
					24	+	+
	93° C.	5h	{ 1	{ 0	24	+	+
					24	+	+
		5d *	{ 1	{ 0	18	+	+
					24	+	+
Concentrated	56° C.	5h	{ 1	{ 0	12	+	+
					12	+	+
		5d *	{ 5	{ 0	18	+	+
					24	+	+
	93° C.	5h	{ 1	{ 0	24	+	+
					24	+	+
		5d *	{ 5	{ 0	24	+	+
					24	+	+

— = no growth; +, +, + etc. = increasing degrees of final growth. The figures represent time (hrs.) at which growth was first seen. The mixture was at the temperature stated for 5 hours daily for 5 days.

LIVESTOCK IMPROVEMENT AND CONTROL OF EPIDEMICS IN TANJORE DT.

BY

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"Good indigenous breeds suited to the climate, already exist in the areas naturally suitable for stock raising and there is no doubt that with carefully controlled breeding, systemic castration of inferior animals, organised disease control and proper feeding of stock, young and old, male and female—combined with improved marketing of livestock and animal products of all kinds, the huge numbers of livestock in India should be far more profitable to the country than they now are" thus observed Mr. A. Olver, Animal Husbandry Expert, The Indian Council of Agricultural Research in his foreward to the book "Livestock in Southern India" by Capt. R. W. Littlewood.

The idea of writing this article is to show how very aptly Mr. Olver has described in this little para the existing state of affairs about livestock and livestock position in Tanjore District. I am sure a worker in another district may find most of the ideas contained therein aptly coinciding with the state of affairs pertaining to the district in which he is working.

The polled cattle of Tanjore District with the nomenclature "Umblachery bred" is only a derivative of Kangayam breed imported into this district probably many decades ago. The progeny of those imported have adjusted to the condition of the soil and climate here and have evolved into what is now known as the Umblachery breed. Mr. R. W. Littlewood in his book Livestock in Southern India observed "except the appearance of the head, these animals present all the chief characteristics of the "Kangayam breed". Efforts have however been made to establish these animals as a separate breed by itself with the idea of declaring this a breed tract, and I am sure recognition given would go a long way in stimulating the breeders of this district to put forth greater energy.

Tanjore District is a delta area with intensive paddy cultivation. Cows are maintained in numbers more for the sake of their manure than for improving the livestock position of the villages. These animals are allowed to graze in the paddy fields after the harvest is over. The practice of collecting big herds of cows in paddy fields with the idea of enriching the field with their dung and urine is widely prevalent in this district. Those that collect the herd are men having a few cows themselves with a breeding bull or two. These bulls attract the cow

owners in villages far and near, who consent to send their cows to the herd. The man that collects such big herds undertakes to house the herd in the fields of those that pay him stipulated quantity of paddy in return for the manure value. The herd is shifted from field to field so as to be of benefit to a number of land owners. These herds are collected during the months of February or March and remain in herds till about July when cultivation commences. These herd collectors then resort to the forest grazing area in North Arcot District with their own nucleus herd after returning the cows belonging to local owners and return after the harvest to collect the same again.

This practice clearly brings forward very many aspects of agriculture and livestock, leaving alone business proposition.

1. *Agricultural aspect* :—The need to manure the fields is great in the delta area in as much as continued exploitation of the fertility of the land is going on year after year. The amount of oil cake and ammonium sulphate available is probably too low or that the ryots are not able to pay for the purchase of the same. In the absence of provision for composting the manure as can be easily done in a mixed farm, the only possible way is to house the animals themselves in the fields during the dry months.

2. *Livestock Improvement aspect* :—The very fact that a man with a small herd with one or two bulls in their midst is able to attract a number of cow owners to send their cows to his herd clearly shows the need for good bulls in the rural area. When an owner sends his cow to this herd he expects to get back his cow in early pregnancy and in most cases that happens. Since these herds are collected during the summer months, great difficulty is experienced by these animals in obtaining enough grazing and wholesome drinking water in certain area. If those that collect the herds have no breeding bulls I am afraid they may not be able to collect a herd at all. In addition, the animals thus collected have no protection from sun and rain during the whole period of three or four months and they are allowed to remain in the open. Concentrates are not brought anywhere near the herd and there is no need to discuss about the same.

3. *Cattle Disease position* :—Invariably the Veterinary Surgeons of this district can expect to have the first set of Rinderpest reports after the return of these animals from the hills in North Arcot District in February and March. When epidemics like Rinderpest start in the herd the caretaker gets alarmed, for he is answerable to very many cow owners of the locality. Lest he should be found fault with, he disbands the herd and returns the animals to the various cow owners. Immediately we find the disease spreading in all the villages that have received back animals from

such a disbanded herd. A long programme of tour for the taluk Veterinary Asst. Surgeon with a colossal expenditure in biological products, not to speak of the damage done to the livestock in the villages is the outcome of this breaking up of the infected herd.

When such is the case, livestock improvement and cattle disease prevention in the district even though may look problems by themselves become very easy problems if only the beginning is made in these herds. Without going into the details in this paper, I want to express that livestock improvement with the "Umblachery breed" alone would get a footing here and attempts made with Kangayam are bound to fail.

After giving a survey of herd-collecting practice in this district, I give below some suggestions that would go a long way in grading the livestock of this district.

1. Those collecting herds should be licensed, the license to be issued by the Veterinary Department after inspection of the breeding bulls owned by them and also making sure that the nucleus herd owned by them is free from contagious disease. The type of bull to be had by him should be prescribed by this department to ensure grading operations on proper lines.

2. Periodical inspection of the herd by Veterinary Surgeons with a view to detecting cattle disease and to protect them from seasonal diseases of the locality like H. S.

3. Strict methods of examining the herd while disbanding.

4. Provision should be made to have the herd inspected by the Veterinary Surgeons during marches up and down to North Arcot grazing areas. This could be done by insisting on the herdmen to adhere to programme convenient to them so as to facilitate veterinary examination enroute. If it is not out of the way, the herd owners themselves can report to the Veterinary Surgeons incharge of institutions enroute, and have their herds inspected,

5. Provision should be made to protect all the animals leaving the forest grazing area by S. S. method so as to make sure that Rinderpest is not disseminated into the districts.

The arrangements if carried out would afford a safe method of grading the progeny to the required end, and also minimise loss due to cattle disease in the district.

FARMING AND FOOD FOR LIVESTOCK

By

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In India where the per capita cultivable area is estimated at 81 cents as per the census of 1938, it will be a hazardous enterprise in national economics to convert lands under food grains to grass farms. More land is needed to produce a good and varied diet, than a poor and monotonous one consisting mainly of cereals. American scientists have calculated that the per capita acreage in U. S. A. to produce the following diets is as follows:—

- | | |
|---|-----------------|
| (1) An emergency restricted diet consisting mainly of cereals. | ... 1.20 acres. |
| (2) An adequate diet at minimum cost, (includes more milk, meat fruits and vegetables) | ... 1.80 " |
| (3) An adequate diet at moderate cost, richer than No. 2 in milk and other nutritious food. | ... 2.30 " |
| (4) A liberal diet, a quart of milk daily, plenty of meat, fruits and vegetables. | ... 3.10 " |

The per capita area under food crops in India is less than that required to produce even an emergency restricted diet.

The total of 444 million acres area of India is divided as follows:—

Area under cultivation.		Area not under cultivation	
Area actually sown.	Current fallows	Waste generally unsuitable for cultivation.	Mountains, forests, deserts not available for cultivation.
214 Million acres.	46 Million acres.	92 Million acres.	92 Million acres.

Due to such non-availability of cultivable lands, every pre-ponderance should be given to Food grains in cultivable areas, because they give a more and direct return than live-stock Milk & Meat are expensive foods, because of the relatively greater amount of labour and land required for their production. If the annual requirements of an adult are estimated at 1,400,000 calories the number of acres required to produce this in the form of milk or meat is much greater than the number needed to yield the same amount of food energy in cereal form.

The area required to produce 1,400,000 calories of certain foods in U. S. A. as per the "land utilisation and the farm problem" U. S. Department of agriculture 1930 is as follows:—

Products.	Number of Acres.	
	Crop.	Pastures.
Potatoes	0.76	
Corn meal	0.79	
Wheat flour	1.45	
Pork and Lard	3.70	0.70
Milk	2.35	1.60
Beef (dressed)	11.30	2.50

In 1933 in Czechoslovakia the following could be purchased for one crown:—

Products.	Calories.
Bread	1191
Beef	172
Pork	90

The 285 Million hectares under potatoes in Germany, could supply the energy needs of 50 million people, but only 6 million (2) of potatoes are used to feed pigs. A chicken yields one pound of meat in return for 14 lbs. of grains.

Sir Thomas More contemplating the transformation of 15th. Century England from an Agricultural to Pastoral country said "Sheep are eating men" It has been said in certain countries that "Pigs are eating men".

Rubner, the Chief Technical Nutrition advisor to Germany during the 1st world war of 1914-18 insisted on the maintenance of the livestock, and increase of animal proteins in human diet with the result that neither human beings nor animals could be sufficiently fed. Due to such misconception of dietetic principles, and undue over-importance of animal proteins, Rubner led the nation to chaos and servitude. By 1917 the caloric content of the food of the ranks fell from 3000 to 1600. Men lost their enthusiasm to fight, became more sluggish and pessimistic and the war was lost. "A million human beings" wrote Hindhede "died in honour of science".

Hindhede maintains that countries could effect great economics by adopting his regime and that it is a profound error to transform cheap food into a costly one by feeding pigs on cereals, which could with advantage be fed direct to human beings. He claims to have saved Denmark from

famine during the blockade of the first Great War (1914-18) by his advice to kill four-fifths of the pigs and one third of the cows in the country. But there is much controversy on this subject.

This theory of Hindhede, that it is simply wasteful to convert vegetable into animal food through livestock, often strenuously upheld, is quite outmoded. There may be a loss in calories, but is usually accompanied by a beneficial change in quality.

In India where 90% of the population subsists on agriculture, livestock is a dire necessity. Without the ox the land would not have been ploughed, the grains thrashed or transported or water from the wells drawn to irrigate the crops. The land would become barren for want of manure. In short the whole agriculture would come to stand-still. Without the cattle even this 81 cents available for cultivation would have remained un-cultivated. India cannot afford to underestimate the value or importance of her cattle wealth. She cannot afford to massacre her cattle so that human beings could get a more abundant diet. It is only proper to recognise the obligation under which the country remains to the cow, and make proper and adequate provision for its maintenance.

In most towns and villages cattle are simply driven out to seek for themselves their livelihood on barren lands, tankbeds or *porombaks*. Due to communal grazing and dearth for grazing lands, these grounds are always overcrowded and the result is that none gets any. No blade shoots on it and the cattle lick more of earth than eat grass and return to sheds as hungry as when they left their sheds. This starvation constant and continuous, tells badly upon their health, growth and the capacity to work. The breed itself deteriorates. The animal becomes prematurely old, and so weak that it is not able to drag a light plough or a small load. Consequently the farmer does not get the maximum work out of the animal and his agricultural operation suffers to that extent.

This pathetic plight of the animals deserves attention and consideration. They have to be fed and, maintained in good health and condition, if they are to be of any use to the country. One way of providing food and fodders is by getting rid of the excess stock. The old and the debilitated are eating the food of the work cattle. If the useless stock could be got rid of, there would be more grazing and fodder for the rest. To quote from the Royal Commission on Agriculture in India, (page 181):—

"For British India as a whole, we estimate that for each 100 acres of nett area sown, there are 92 acres of uncultivated land available for grazing to which should be added 21 acres of fallow and on these 213 acres there are supported 20 bullocks, 17 cows, 16 other cattle, 3 male buffaloes, 6 she-buffaloes and 5 young buffaloes, a total of 67 cattle in addition to 27 sheep and goats and some other stock."

"Having regard to the very poor quality of grazing available and to the fact that it fails to provide adequate maintenance for cattle at the season of the year when fodder grown in cultivated land is scarcest, we are of opinion that this number of cattle is a very heavy stock for the land to carry. If the cattle were to yield a profit which would be accepted as satisfactory in countries where stock-keeping is strictly economic, the bullocks would require to be fully employed and the cows to be of a heavy milking strain and the manure to be carefully conserved and returned to land".

From what is said above three things are clear.

(1) There are too many cattle on the land consisting of useful and useless only.

(2) If the useless one are got rid of then the useful ones would be fed better.

(3) That no cultivable area can be allotted for grass lands. If so how can the useful ones be fed better?

In this connection the following points require consideration.

(1) The waste lands are not properly used for growing fodder crops or grass. To do this successfully one should have a thorough knowledge of the type of soil, amount of rainfall, duration of dry season and above all the habits and resistance of grasses to adverse conditions such as draught, excess of rain or inundation. All grasses do not grow equally well on a particular plot. Some Grasses require more moisture, some less. Some die of inundation while others resist. Some die easily of too much of heat and draught while other varieties withstand. Hence it is necessary to study the soil and climatic conditions before any attempt is made to make a perennial grass land of the waste land. There again the nett yields of the various grasses vary. Some under ideal conditions give about 20,000 lbs. per acre while others on the same plot can give only about a tenth of that yield. Hence many of the useless grasses, which are as useful as the barren cows that graze on them should be got rid of and better ones planted. Hilly slopes can be planted with grasses, which will prevent erosion and conserve moisture. Marshes should be planted with those like "Bracharia" that will dry up the land and thrive well. Tankbeds should be planted with those that will resist inundation. All these cannot be done by individuals. It should be worked out as a national policy.

(2) There are a lot of reserve forests, especially Panchayat reserve forests. Due to erosion on such lands, very few grasses grow on them. Thorns and shrubs are the only things found in such areas. It will be possible to make better use of them if suitable grasses are planted,

(3) Fallow lands can be cultivated with advantage with short-term fodder crops. Legumes will enrich the soil. Cultivation will keep down the weeds. This will provide work for the work-cattle that are idle during off seasons. Sometimes the aftermath can be ploughed in to increase the humidity of the soil.

(4) Certain types of cultivation will permit inter-cultivation of fodder crops. In such cases the fodder crops form a shade for the main crop and protect them from unfavourable weather condition. By the time the permanent crops come up, the fodder crops can be removed and sufficient freedom allowed for the main crop to come up and yield their best.

(5) It is possible to keep cows and pigs without "eating men". Many food crops and farm produce have byproducts which cannot be used by men for consumption. For e.g. paddy straw, cholam stalk, groundnut cake, cotton seed, rice bran, wheat bran, molasses, sugar cane leaves &c. Cattle are fed mainly only on such substances, and very rarely are they in India, fed with those that are edible for human beings. But to make this possible a threshold value has to be maintained. We can keep only a certain limited number of cows and pigs. If they exceed that number they become under-fed, on the fodder available. So also in the case of fowls. Though for 14 lbs. the chick gives only one pound of meat, it is possible in cottage industries to feed them on waste products and get the one pound of meat without robbing its owner of even half pound of his food grain. There again the number is to be limited to the available waste products. Some of the byproducts can be chemically treated and made more nutritious for the cattle, e.g. straw with caustic Potash. The bulk of the groundnut husk which goes as waste should be treated likewise and used for feeding cattle. There is, in industry and farming some waste product which can be converted into fodder.

(6) The excess of fodder available in seasons should be collected and properly stored and used to tide over the period of scarcity. This is not at all practised in India. Silage or hay are innovations to the farmer in this country. Government will have to subsidise such of those schemes as to give encouragement. But silage cannot be used by one man with a few cows as they get spoilt if kept for long periods after opening the pit. Collective farming will have to be practised.

(7) *Mechanise farming*:—Years back when steam engine was invented many people thought that horse breeding would soon become extinct. So also when the army was mechanised. But we see that there are still various works which machines are not able to do. In jungle war-fares the humble mule played its bravest part. Mechanization of farming

will reduce the work of the ox and consequently the number required for work. This means that only a few are to be maintained and when few, they can be maintained well. Hence farming is to be mechanised wherever possible.

Cattle or sheep are not maintained solely for work. They are required to give us meat, and milk, which being biological products, are superior in quality vegetable products. But first of all the question, is of the quantity, and when that is satisfied the quality is to be considered. And, therefore, although the agriculture may be mechanised, the cow and the sheep can never be written off the list.

I have not endeavoured to go into the details of each item suggested above, as that is beyond the scope of this small article,

SUMMARY

Cattle can be fed better

- (1) By reducing the surplus stock,
- (2) By cultivating grass in wastelands,
- (3) By growing grasses in Reserve Panchayat Forests,
- (4) By Cultivation of fallow lands with short term fodder crops,
- (5) By inter cultivation,
- (6) By treating the farm bye-products chemically and making them assimilable for animals,
- (7) Preserving excess quantity,
- (8) Mechanization of Farming Industry.

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IMPROVING THE MILK SUPPLY OF TOWNS*

BY

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In dealing with the problem of milk supply in India, the vital distinction between increasing the milk supply of a town or a particular urban area and of a province or the country as a whole is to be recognised. The former, unlike the latter, can be achieved in comparatively short time by adopting measures such as are proposed to be discussed at some length in this note. These measures aim at making the milk produced in areas surrounding the town available to it instead of the milk being converted into products, as at present.

The improvement in the existing milk supply of a town can broadly speaking be brought by (i) augmenting the existing milk supply by developing new sources, to enable the supply to cope with the demand, and (ii) reorganising the existing system of control and supervision of the milk supply to the town.

The present high level of prices of milk and milk products in town is mainly due to the fact that supply is not able to cope with the demand. The first step to be taken, therefore, is to find out ways and means of augmenting the existing supply. What these should be would depend on the location of the town and its surroundings. The present system of producing milk by housing cattle in the heart of the town has been universal in the country and has been found to be most uneconomical and unhygienic, besides leading to the gradual destruction of the valuable cattle wealth of the country. Any new method adopted should, therefore, aim at abolishing these stables and for that reason the source for the increased supply of milk would have to be looked for from areas outside the towns. This source may be (i) organisation of milk supply from areas surrounding the town, (ii) establishment of creameries in milk-producing areas, and (iii) establishment of dairy farms.

Organisation of milk supply from areas surrounding the town will divide itself under two heads: (a) Milk supply from villages lying adjacent to the towns or what may be called 'inner belt'—extending up to a radius of about 15 miles of the town, and (b) milk supply from villages lying beyond the radius and extending up to 50 miles, which may be called the 'outer belt'. Of the two, it is desirable that the organisation of the milk supply from the 'outer belt' should be taken up first because that will help in actually augmenting the milk supply without disturbing the present supply as the milk is already being brought by various means to the town from the inner belt.

*Indian Farming, Vol. VII, No. 10.

The Inner Belt

Many of the towns in India where shortage of milk is felt at present are fortunately surrounded by areas which form potential sources of supply of milk. Almost every town, whether small or large, derives nearly 50% of its milk requirements through what are called 'milk carriers'. The milk collected by them from the villages is carried on cycles or head loads and distributed direct to individual customers. Their range of work extends even up to 12 miles radius from the town. For some of the larger towns like Bombay, Madras, Calcutta, etc., which are well provided with local trains, milk is brought even from greater distances by these carriers. This is one of the most important agencies in the milk supply to towns and one which presents great possibilities of improvement. The sources of supply of milk in this system also lend themselves for further increased production. Some of the measures which can be adopted for this purpose are :

(i) To organise the producers on co-operative lines and arrange for them to deal direct with the consumers themselves, to the mutual advantage of both, by doing away with the middlemen or the carriers.

(ii) To organise the carriers themselves on co-operative lines by giving them facilities of a central milk collecting depot or depots from which milk can be economically distributed collectively, instead of each individual carrier going round the delivery. This will ensure a greater uniformity of method and fewer distributing agencies, consequently less supervision and control by the authorities concerned.

(iii) To open depots for cattle feeds in the producing areas and subsidizing the supply, if necessary.

(iv) To provide milk supply cans of suitable types and at a concession rate, as also cycle tyres, tubes, etc., which are very difficult to obtain at present.

(v) In the case of carriers bringing milk by local trains, allowing them concession in the freight and providing a special carriage or compartment where milk can be put in a clean place during transit.

(vi) For the municipalities to provide special depots well-distributed in the town, from where milk can be distributed to the areas apportioned to each set of carriers.

(vii) To give loans to the organised small producers for purchasing cattle and feeding stuffs to effectively increase the production of milk in the zone surrounding the towns. It has been found from experience that by proper feeding and maintenance the milk yield of a village cow can be increased even up to 50 per cent.

The Outer Belt

The organisation to be set up for the purpose should aim at organising the producers, the collection of the milk from them and its rapid transport to a suitable centre where it can be processed and distributed through a reliable agency or agencies, so that the quantity of the milk is assured and it is sold at a reasonable price to the consumers. Such an organised effort calls for the following:

(i) *Survey*:—A rapid survey of the areas is necessary in order to ascertain firstly the quantity of milk available for collection after allowing for the domestic need of the producers and the wide fluctuations for the different seasons which invariably occur under village conditions, and secondly the disposal of surplus milk and the scope for developing this source. Such a survey can be satisfactorily carried out in two or three months by employing adequate temporary staff, but this will require expert guidance.

(ii) *Organizing the producers*:—This will have to be undertaken preferably on co-operative lines, based on the data obtained in the survey of the area, so that those villages or centres which produce sufficient quantities of milk which can be handled economically need only be considered in the earlier stages. It will be desirable to attempt to centralise the milking in the villages right from the beginning and in order to provide an inducement for the purpose to the villagers, each village should be provided with facilities of water supply, etc. the cost involved being partly or wholly borne by the Government.

(iii) *Collection of milk*:—This should be done at centres which are so situated that the collection of milk may be done as expeditiously and economically as possible.

(iv) *Rapid transport of milk*:—Quick haulage of milk to its destination soon after production is very essential as the time factor is most important with such a highly perishable food as milk. The haulage can be done either by rail or road, but in a majority of cases it will have to be done by the latter, in which case motor transport will have to be employed. Motor lorries for this purpose will be required.

(v) *Processing of milk*:—As milk will be collected from various sources and produced under insanitary conditions and as some time must elapse before it is made available to the consumers it will have to be processed (heated or chilled or both, i.e. pasteurised) and for this a processing centre or pasteurising station will have to be established, preferably in the consuming town itself, with facilities of cold storage etc. so that the distribution of milk can be regulated according to the requirements of the consumers irrespective of the time of milking in the villages.

(vi) *Distribution depots*:—The milk collected and processed above as can then be distributed to the consumers over the counter through depots specially provided for the purpose, where milk of guaranteed quality can be made available to the public. It is not considered feasible in earlier stages to attempt house to house delivery of milk, particularly in view of the shortage of containers and bottles.

(vii) *Supply of cattle feeds*:—As a necessary adjunct to such a system of milk collection and supply, arrangements will have to be made to supply cattle feed such as oilcakes, bran, chunni, etc., to the village milk producers so as to give them an incentive for producing more and better quality of milk. In some cases this idea of helping the villager can be further developed by arranging for the supply of his daily requirements such as kerosene oil, sugar, cloth, etc. against delivery of milk.

Co-operative Working

The scheme as outlined above by virtue of its special features of collective working may preferably be run on co-operative lines under the aegis of Co-operative Department of the province.

Containers governing the selection of a town for the scheme and the pre-requisites to the successful adoption of a scheme of this nature will be as follows:

(a) That the town selected for the supply of milk is surrounded by milk producing villages or centres lying within 15 miles of it and the quantity of milk produced by such centres should be sufficient to make its collection, haulage, handling and distribution economic on a consideration of working costs. In the light of the experience gained so far it may be stated that each village or centre should be on an average be able to supply a minimum quantity of 2½ maunds of milk a day.

(b) That the majority of villages to be tapped should lie as far as possible along side the roads to be traversed or at a distance not exceeding 3x2 to 3 miles from the road, as it is necessary to collect the milk rapidly for transporting it to its destination.

(c) That the area is well provided with roads which will permit of the haulage of milk by motor transport in all seasons of the year.

(d) That the producers must be assured of the market for their milk throughout the year at a predetermined price and the milk must be paid for periodically, as ready cash is the greatest need of every stockowner.

Establishment of Creameries

A scheme for establishment of creameries in milk-producing areas in the provinces may or may not be found feasible for all towns or urban areas. The location of some of the towns, which are generally of a large size like Bombay, Calcutta, Madras, etc. would permit of the additional collection of milk being

drawn only from sources placed far away from them and which would involve long-distance transport of milk by rail, after processing it at the collecting end itself. Such sources of supply generally are to be found in every province and which at present are not fully exploited for the supply of milk in liquid form. The organisation to be set up for obtaining milk from these areas would consist of the following.

(i) Establishing a creamery or milk collecting and processing centre in the milk-producing area itself.

(ii) The transport of milk so processed by rail and in refrigerating vans over distances ranging from 50 to 300 miles.

(iii) Establishing a milk distributing organisation in the city itself with sufficient cold storage facilities.

The extra overhead charges involved in a system of milk supply of this kind will be more than compensated for at by the low price at which the milk can be purchased in these milk-producing tracts. To make the working of such a creamery economically possible it should be in a position to receive and process at least about 6,000 to 8,000 lb. of milk a day, but this quantity would vary from place to place according to circumstances. The whole of this organization can be run either by a Government agency or through private enterprise which may be subsidised. It will, however, be possible to build village milk producing societies round about such creameries and in course of time they may be run on co-operative lines.

Establishment of Dairy Farms

Experience has shown that milk obtained from villages fluctuates widely in quantity according to seasons and that it is at its lowest in summer. Since the supply of milk to the consumers must be constant and assured throughout the year, in order to counteract the above drawbacks there should be another and more dependable source of supply of milk for the town. This should be in the form of a dairy farm or farms established as near to the town as possible either by Government or through private enterprise. In the latter case a subsidy may be provided in some form or another preferably by the payment of a certain amount per pound or maund of milk of a guaranteed quality delivered to the town. Such farm or farms should be producing at least 25 per cent of the quantity of milk obtained under the village system to meet the deficit during the scarcity period. The following facilities may be needed to establish and encourage such a supply.

(i) Facilities of Land grazing.

(ii) Provision of irrigation water for the cultivation of fodder crops at a concession rate.

(iii) Concession in railway freight with the facility of refrigerating vans.

(iv) Provision of necessary equipment for the dairy, etc. under priority.

(v) Providing subsidy to enable the farm-produced milk to be sold in the consuming areas at controlled rates.

Control and Supervision

Reorganisation of the existing system of control and supervision of the milk supply to the town is of supreme importance. No matter how carefully the agencies for the increased milk supply at a place are arranged they will not stand a fair chance of surviving unless these are effectively protected against unfair competition from the trade, both in respect of price as well as quality. This calls for proper control and supervision over the supply. One of the greatest handicaps in the proper supervision and control of the milk supply of a town is the existence of the innumerable agencies or channels through which milk is made to pass during its handling and distribution in a town. This also hinders the development of the dairy trade on right lines. The reorganisation of the present system of milk supply calls for definite measures to be taken. They may be summed up as follows.

(a) *Creation of a milk supply organisation*:—Adoption of measures which would ensure adequate milk supply on the lines indicated above should provide such an organisation for obtaining milk from reliable sources. Such an organised effort will enable the milk-supplying agencies to be reduced to a few selected ones and this will call for the division of the milk-producing areas into zones, so that a zone may be assigned to a particular agency to prevent the various selected agencies from competing with one another unfairly.

(b) *Creation of milk procurement and distribution organisation*:—This is necessary for replacing the innumerable individuals employed in distributing milk, by a few selected agencies. As in the case of (a) above, the area of trading in the town will also have to be zoned out, so that each agency is allotted a zone to prevent unfair competition.

(c) *Removal of cattle stables from urban areas*:—As more and more milk is imported in the town from the rural areas through an organised effort, the city milch cattle stable will have to be removed. Their removal will call for (i) the prevention of the return to the city of cattle salvaged from the stables when they come into calf again and (ii) the absorption or colonization of the replaced animals from the city at centres away from the town from where milk could be easily obtained for the town.

(d) *Adoption of an effective system of licencing and supervision*:—The introduction of a complete and effective system of licencing of the trade with suitable standards for quality and an adequate and efficient staff for enforcing supervision and the standards of quality will be a necessary adjunct to such a reorganisation.

(e) *Appointment of a milk control board*:—Such a board may be for the province or the state as whole or for the town in the first instance, where the improved milk supply scheme is to be worked. Experience in the past has shown that efforts made at reorganising the milk supply of a town were always too much diffused and there was no co-operation between the man in the trade and the controlling authorities in improving matters. It is, therefore, felt that there should be a central independent body which should coordinate the activities coming under the reorganisation of milk supply of a town. It is suggested that a milk control board should be created. Such a board should be constituted of a limited number of members, not exceeding seven, representing government, municipality, producers, traders and consumers. Its primary functions should be the following:

(i) To safeguard the interests of the producers, traders and consumers.

(ii) To periodically fix the purchase as well as sale prices of milk for that area.

(iii) To control the marketing and distribution of milk according to the needs of the different classes of consumers

(iv) To control the production of milk and milk products in a consuming area as well as in areas adjoining it.

(v) To fix standards of quality of milk and milk products sold in that area.

(vi) To act in an advisory capacity in matters relating to the policy to be followed and measures to be adopted for the development of the milk trade.

Technical Guidance

Whatever be the type of scheme adopted by the provinces or states for improving the milk supply of a town, technical help and guidance will be needed to solve the difficulties which are bound to arise at every stage with the commencement of the scheme. The prerequisite for the success of such a venture will be the provision of adequate technical staff. No doubt expert help and guidance will always be made available from the Centre but the Provincial Governments shall have to maintain staff of their own to be on the spot. The strength of the staff required will depend on the amount of dairy development work undertaken by the province concerned. Since this kind of work will require qualifications and experience of a high order, the pay and status of the posts to be created should be such as to attract men of the right type who could command the confidence of the trade.

Urgent Steps

This note has been drawn up with the idea that it will suggest to the Provinces and the States the various ways and means which are possible to adopt for improving the milk supply of a town. The steps which should be taken to achieve this are briefly indicated below.

(a) Appointment of technical staff.

(b) Starting of surveys of (i) the potential milk-supplying areas to determine to what extent each area can be depended upon to supply the needs of the towns and for organising the supply from that area whether on co-operative lines or by the establishment of creameries or milk processing centres, (ii) sites suitable for establishing large-scale dairy farms so that the milk supply from the rural areas can be supplemented by milk obtained from reliable sources, and (iii) urban areas or towns where the reorganisation of the milk supply is proposed to be introduced. In the latter connection it must be remembered firstly that instead of large cities where the problems are too numerous and complicated it may be desirable to select a few small towns to begin with where a more complete model scheme on an experimental basis may be tried out. Secondly the town or area where the shortage is most acute should be tackled first, both for production and distribution and thirdly, the total requirements of a town or area may not be met all at once but it may be feasible to mitigate conditions on a progressive and limited scale to begin with.

(c) Establishment of a milk control board and the creation of an organisation for the production of milk and another for the procurement and distribution of milk based on the surveys carried out.

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THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

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MAY, 1948

No. 6

Editorial

THE VETERINARIAN'S ROLE

What is the role of the Veterinarian in the scheme of things to be and in the reconstruction plans now being formulated all over the country—is a question that is being forwarded to us by many a Veterinary Practitioner in the various parts of the country who describe to us in a very pathetic and painful manner the conditions obtaining in their places. They write that it is all very well to say that the Veterinarian is the one man who can ensure the supply of clean and wholesome food to the nation and who can enable the country to become self-sufficient in the matter of our food supply, but who is there to realise his potentialities and give him all the reasonable facilities and opportunities for development? It also appears that the Veterinarian is being slowly elbowed out of his legitimate spheres of work and relegated to the back ground by non-Veterinary men. This cry of denial of opportunities and facilities to the Veterinarian is becoming more and more insistent that we feel it highly necessary to draw the attention of the Government and others responsible to the administration of the country and earnestly request them to rectify matters before they become too serious. From the Prime Minister down to the peasant, everyone is praising the importance of livestock to the land. Mahatma Gandhiji, as long as he was alive, spared no effort to stress the economy of the cow, and repeatedly said that we cannot restore our prosperity unless we rehabilitate the cow to its pristine glory and position. But all these become mere words when it is sought to be translated into practice. It is not realised sufficiently that the Veterinarian cannot possibly make good his claim of the Guarantee of the Nation's food supply unless he is given the opportunities. He must have the wherewithal to proceed: he must be

given the necessary part to play. As it is, as one of our colleagues very pathetically wrote, the Government are able to find Crores and Crores of Rupees to instal machinery for producing Artificial Fertilisers, but they hardly spend a few lakhs to improve the existing natural Master-Fertiliser in the cow. This picture is not overdrawn. We were told of the country being studded with Farms in the the course of a few years, of Veterinary Research Institutes here and there, of breeding stations in the various breeding districts etc., etc. All these are very good and encouraging indeed. But who should be entrusted with these things? Who else, but a Veterinarian? Unfortunately, it is found that he is not given the role he is entitled to get by virtue of his qualification, training and equipment. Non-Veterinary men who know very little about animals are being selected for livestock breeding stations and for animal nutrition work. And even in the Veterinary Research Institute at Mukteswar and Izatnagar—the premier Veterinary Institutes in India—we are given to understand that the Veterinarians are being slowly ousted and non-veterinary men are being pushed in. This is indeed very sad. Is this conducive to healthy development of Animal Husbandry? Is not a knowledge of Veterinary Science essential for animal breeding and nutrition work? This question of who should be in charge of livestock operations has long been a point of acrimonious discussion, as long as there was no organised Veterinary Service. But now when Veterinary Science has sufficiently well advanced, and when highly qualified Veterinary graduates are available, it is indeed idle and unprofitable to start the discussion all over once again. Sir Frank Ware, till recently the Animal Husbandry Commissioner with the Government of India, drove the nail in hard when he gave his opinion in the following words: "In the subject of livestock production and animal health, they (Veterinarians) required the help of Geneticists, Bio-chemists, Pure-scientists who devoted their time to subjects like Helminthology, Entomology, etc. To get a 'punch' into this question of livestock improvement, they must have that 'centrally directed drive' and he could not see anybody who was going to be able to give that drive except a Veterinary Graduate." And, therefore, to rake up this question once again at this time, is a fruitless task which will profit no one.

It can only lead to diversion of useful energy into a barren tract. We appeal to the Governments, both Central and Provincial, with all the earnestness at our command, to give the Veterinarian a fair deal and give him the necessary facilities and opportunities to play his part in full to the people and to the country.

We would like to take this opportunity of repeating our appeal to the profession once again and request it earnestly to organise and form at a very early date an **Indian Veterinary Council** to look after its interests. Encroachments into its fields and denial of legitimate opportunities for its advancement have become possible owing to the absence of a custodian of its rights and privileges, not less its duties and responsibilities, and it is high time the profession set about it in right earnest soon.

VETERINARY OR ANIMAL HUSBANDRY

[We gladly give prominence to the following letter from Rao Bahadur R. Swaminathan, B.A., G.M.V.C., Madras. Ed. I.V.J.]

The Government Department which concerns itself with the livestock of the country is designated differently in different provinces. In some, it is simply Veterinary Department: in some others it is Veterinary and Animal Husbandry Department: while in a few others it goes by the name of Animal Husbandry Department. All these mixed and varied designations, are, I am afraid, the result of the lack of correct understanding of what really Veterinary Service means. And, therefore, the following definition of Veterinary Science as given in Encyclopaedia Britannica 14th Edition will, I am sure, be found interesting:

"Veterinary Science is the branch of knowledge that deals with the anatomy of the domesticated animals, their physiology and racial characteristics, their breeding, feeding and hygienic management, the pathology and treatment of their diseases and injuries, their relation to man with regard to inter-communicable maladies and to his use of their flesh and products."

This elaborate definition from an authoritative international publication should be sufficient for us to decide that the correct description should be 'Veterinary Department' and nothing else. It would be a good thing if this designation is adopted uniformly all over the country.

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THE LATE PROFESSOR DONALD CAPELL MATHESON

We deeply regret to record the passing away of Prof. Matheson of the Royal (Dick) Veterinary College, Edinburgh, on 8th March, 1948, at the age of 67. In his death, the profession has sustained a grievous loss, and the *Indian Veterinary Journal*, a very noble overseas Patron.

As our readers are aware, Prof. Matheson was a regular contributor to this *Journal* ever since its inception. His articles have always been characterised by a directness and simplicity which revealed a great intellect and deep understanding. His life, like those of many great men, appears to have been one continuous toil and labour and, from the Memoir which has appeared in the *Veterinary Record*, we see the Professor had to carry 'a very heavy burden' ever since he took over the chair of Pathology and Bacteriology in 1913. To quote from the Memoir, "It was typical of the man that he was never known to intrude his difficulties and troubles on others, nor did he ever say a harsh word against any man. Professor Matheson had a simplicity of character which puzzled many, but from behind a facade of deep seriousness, there would every now and then flash out a whimsical and arresting utterance which revealed the hidden depths of the man". Many students from India who had opportunities of studying and working under Professor Matheson have nothing but praise for the Professor's abiding interest in their welfare and study.

We extend our heart-felt and deep sympathy to Mrs. Matheson and other members of the bereaved family.



THE LATE PROFESSOR DONALD CAPELL MATHESON,

F.R.C.V.S., D.V.S.M., F.R.S.E.,

Professor of Pathology and Bacteriology,

Royal (Dick) Veterinary College, Edinburgh, (SCOTLAND).

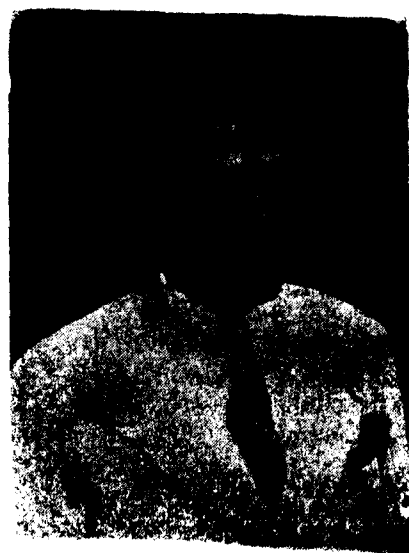
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News

THE TRANSFER OF THE REMOUNT AND VETERINARY SERVICES OF INDIAN ARMY TO THE ARMIES OF THE DOMINIONS OF INDIA AND PAKISTAN*

By

BRIGADIER E.S.W. PEATT, O.B.E., F.R.C.V.S.

The Director of Remount and Veterinary Service (D.R.V.S.) Supreme Commander's Headquarters, India, completed the hand over of his responsibilities to the Ds. R.V.S. Army Headquarters, India, and Army Headquarters, Pakistan, on 15th October, 1947. Thus ended over fifty years' administration of the Remount and Veterinary Services of the Indian Army by British Officers.

The following list gives the names of Directors of Veterinary and Remount Services in India from 1889 up to the present day :

Principal Veterinary Surgeon in India

1889—Lieutenant-Colonel W. A. Russel

Principal Veterinary Officers in India

1894—Colonel F. Duck
1897—Colonel H. Thomson
1902—Lieutenant-Colonel B. L. Glover, C. B.
1903—Colonel I. Matthews, C. B.
1906—Colonel J. A. Nunn, C.B., C.I.E., D.S.O., F.R.C.V.S., F.R.S.E.
1908—Colonel C. Rutherford, C.M.G., F.R.C.V.S.
1913—Colonel E. H. Hazelton, F.R.C.V.S.
1916—Colonel L. V. Blenkinsop, D.S.O.

Directors of Veterinary Services

1918—Brigadier-General C. E. Nuthall, C.B., C.M.G.
1919—Major-General Sir John Moore, K.C.M.G., C.O., F.R.C.V.S.
1921—Colonel on the staff H. T. Sawyer, C.B., D.S.O.
1923—Brigadier F. W. Hunt, C.B., C.M.G., C.B.E.
1928—Brigadier A. J. Williams, D.S.O., F.R.C.V.S.
1932—Brigadier H. S. Mosley, D.S.O.
1936—Brigadier H. C. Dibben, C.I.E.
1940—Brigadier J. J. M. Soutar, C.B.E.
1944—Brigadier E. S. W. Peatt, O.B.E., F.R.C.V.S.

*Journal of R. A. V. C. Vol. XIX, No. 2,

- (a) The personnel strength of the P.R.V.C. is greater than that of the I.R.V.C. because of the additional Remount commitment in Pakistan.
- (b) The large number of civilians employed for labour in Remount Depots are not included.

A new commitment to be added to the responsibilities of the D.R.V.S., in both Dominion Armies is the administration of the Military Farms Department.

A copy of the farewell letter from the D.R.V.S., Supreme Commander's Headquarters, to the respective Directors of Remount and Veterinary Services in India and Pakistan is reproduced below :

My Dear ———,

On the occasion of the transfer of my responsibilities as Director of Remount and Veterinary Services, India and Pakistan, I wish you and all ranks of the I.R.V.C., in India/Pakistan the best of good fortune in the future.

I am confident that under your command the I.R.V.C./P.R.V.C. will maintain the high standards of efficiency of the Remount and Veterinary Services of the past of which both Services were justly proud.

It is the earnest hope of all British Officers of the Remount and Veterinary Services who have served in your country that the traditions of the past will not be forgotten and that the bond of friendship forged by many years of service together will continue into the future and ensure that happy relations will always exist between the Remount and Veterinary Services of India and Pakistan.

Brigadier Gurbachan Singh,
D.R.V.S., A.H.Q.,
India and Simla.

Yours, Sincerely,
E. S. W. PEATT (Brigadier),
Director of Rem. and Vet. Services.

Brigadier Mahk Gulshir Khan Noon,
O.B.E., D.R.V.S., A.H.Q.,
Pakistan, Rawalpindi.

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Clinical Articles

MELANOMATA IN EQUINES

By

M. MAQSOOD, L.V.P. (Honours), P. G. (MUKT.),
Civil Veterinary Hospital, Murree Hills, Punjab

Melanomata originate in tissues which are normally pigmented i.e., the skin in animals, and in which the melanoblasts or the tumour cells, probably derived from the mesenchyma, manufacture a brown iron-free pigment called *Melanin*. In some of the tumours the melanin constitutes about 7.3 per cent by weight of the fresh tumour substance. Jackson (1936) states that much confusion surrounds the problem of histogenesis and classification of melanin pigmented tumours and in spite of enough literature available on the subject, we can not reach final conclusion, until we know accurately the genesis of cells carrying melanin pigment and the metabolism of melanin in the body. Melanotic tumours occur in several species of animals i.e., horse, goat, cattle, dog, pig, fowl and cat but especially quite frequently in aged grey horses and Angora goats (Caylor and Schlotthauer, 1926; McGowan, 1928; Thomas, 1929; Jackson, 1936; Gaiger & Davies, 1938). Dorssen's (1903) work shows that about 80 per cent of grey horses develop the disease if they reach old age and the incidence is such that it may be safely predicted that every such animal that lives long enough, is fated to develop these tumours. Rarely melanomata develop in horses of other colours such as Bay, Chestnut and Roan (McFadyean, 1933; Ajello, 1937).

The special liability of grey horses to melanomatosis is connected with the steady whitening of hairs; and, as after middle life the demand for melanin pigment rapidly diminishes, owing to the increasing numbers of white hairs which no longer require melanin, the incidence of the disease increases with advancing age. The whitening of the hairs is not a process of mere bleaching but is the result of an actual cessation of the manufacture or absorption of melanin at the roots of the hairs. Thus there must arise in the animal system a considerable disturbance either in the provision or manufacture of melanin. This may be probably one of the factors of tumour formation in grey horses but the exact etiology is still obscure (Hadwen, 1932; McFadyean, 1933). Ajello (1937) favours the view that melanomata may develop in situations in which melanin is normally absent and are due to hypo-function of the chromaffine system in particular of the adrenals. Beattie and Dickson (1943) state that in man, abnormal increase of cutaneous melanin pigment is found, in chronic diseases of the ovaries, uterus and of the endocrine glands especially the adrenals.

The primary tumours may develop in connection with the skin over the body exclusively but their commonest sites are the ventral surface of the tail, anus, vulva and perineum. The property of producing metastasis varies considerably, some being very malignant, while others are benign; remaining unchanged for years and showing no tendency to recur after removal. The perineal lymph glands may become involved through metastasis by way of lymphatics and in the same way, at a later stage, the peritoneum and thereby the pleura. In advanced cases multiple tumours may develop in the spleen, liver and lungs; multiple tumours may develop in the spleen, liver and lungs; metastasis occurring probably by way of blood streams.

In India, Mangrulkar (1944) had given an account of melanotic tumours which were collected from five horses, five males and three bullocks. In this note five cases of melanomata observed in grey horses, at Lahore and Murree Hills (Punjab), are recorded.

Case Reports

1. A light grey, I. B., aged, mare, was brought to the Punjab Veterinary College Hospital Lahore, on 21st. July, 1945, with the history that about two months previously, two marble sized hard protuberances were noticed around the left lip of vulva and these continued to increase in size. On clinical examination numerous hard rounded growths, varying in size from that of a pea to a walnut were seen on the ventral surface of the tail; larger ones being near its root, besides two walnut sized growth, around the left lip of the vulva. As narrated by the owner, the former growths were present about one and a half years previously, when the mare was purchased but these had also increased both in size and number. The skin over the tumours was intact and on sections the growths presented smooth, somewhat glistening and practically black surfaces. Microscopic examination showed that the growths had the histology of a melanoma.

2. The subject a grey, I. B. mare, age about 10 years, was examined on 28th, March, 1943 in the S. P. C. A., Hospital Lahore. Four hard rounded growths (three about walnut and one marble sized) were seen, on the ventral surface of the tail, near its root and as stated by the owner these growths were noticed about two years previously. The skin over the growths was intact. The characters of the tumours resembled those of a melanoma.

3. An aged, grey, I. B., Horse, was examined on 20th. October, 1943 in the S. P. C. A., Hospital Lahore. Multiple melanotic tumours, varying in size from that of a pea to a walnut, were observed on the ventral surface of the tail and in the perineal region. It was stated by the attendant that these protuberances were noticed about two years previously and some of these had increased in size.

4. The subject—a grey, I. B., mare, age about 16 years, was examined at the annual inspection of riding horses for soundness in Murree Hills on 30th, April, 1947. A few hard growths varying in size from a pea to a marble, were seen on the ventral surface of the tail, in about its middle. It was stated by the owner that these growths were seen about five months previously.

5. The subject a light grey, I. B., mare age about 13 years, was examined at the annual inspection of riding horses for soundness, in Murree Hills on 30th, April, 1947 and a marble sized growth was seen on the ventral surface of the tail, near its root. The owner was unable to tell about its period of duration.

Pieces of the growths removed from cases Nos. 4 & 5 were sent to Research Officer, Pathology and Bacteriology Section, I.V.R.I., Izatnagar (U. P.) for histo-pathological examination. The characters of these tumours resembled those of a melanoma. Cases Nos. 1, 2, & 3 were examined, while the author was working in the Pathology and Bacteriology Section, Punjab Veterinary College, Lahore.

SUMMARY

1. The available literature on melanomata in equines is reviewed.
2. Five cases of Melanomata in grey horses are recorded and the tumours were present on the ventral surface of the tail, vulva and in the perineal region.

ACKNOWLEDGEMENTS

Thanks are due to Ch. Mohammed Yaqub, P. V. S., the then Assistant Professor of Pathology and Bacteriology, Punjab Veterinary College, Lahore, for his valuable suggestions.

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MILK THERAPY IN A CASE OF NON-PARASITIC SKIN DISEASE

By

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Venkataratnam (1941) successfully treated a number of cases of moist eczema in calves and dogs by milk therapy. It would be of interest to know whether it is also applicable to skin diseases other than eczema. The following case shows that it is worth a trial in such cases also.

A 17-day old bull-calf was received for destruction with a report of extensive skin lesions, possibly as the result of 'tick feeding' experiments. The animal, practically denuded of hair, presented a raw skin with numerous haemorrhagic spots. Pruritis was absent. The lesion extended over wide areas particularly the chest, belly, withers, knees, shanks, shoulders, head, neck and ears. The external surface of both ears was covered by scabs, exposing a raw surface on removal. There was no constitutional symptom except debility. Induration of the skin was absent.

Slight lukaemia with eosinophilia and anaemia changes were evident on blood smear examination. A few nematode ova were found on fecal examination, but their number was too small to incriminate helminths as the cause of the condition. Skin scrapings as well as crusts were examined for mange parasites with negative results.

Treatment was adopted as an experimental measure. Standard dressings, including 'Odylen' (Bayers) were tried without effect and the condition deteriorated daily. As a last resort 'milk therapy' was decided upon. Fresh cow's milk was boiled in a clean beaker, cooled and strained through sterile muslin to remove the albuminous coagulation; first injection of 25 c.c. was given subcutaneously behind the shoulder. It caused a transient swelling. A second injection of 30 c.c. was given 4 days later followed by a third and a fourth injection with 40 and 50 c.c. respectively at 4-days intervals. Within a week after the last injection the calf began to show definite improvement. The skin scabs fell off, hairs appeared over the surface and the animal was well on its way to recovery.

My thanks are due to Mr. K. Sreenivasan, Veterinary Officer, Indian Veterinary Research Institute, Mukteswar, for permission to treat this case.

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PENICILLIN IN BROKEN KNEE

By

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History:—A two-months old she-buffalo calf of the Government Civil Dairy, Cuttack, one day injured her left knee.

The swelling that resulted from this trauma became prominent and painful and the effected knee was held in a semi-flexed position. On examination it was seen that, along with the bruise of the part, there was a tiny opening leading into the knee joint.

Treatment:—The area of the knee all round was shaved, and a thick layer of Antiphlogistine was applied and bandaged. After three applications, the swelling subsided markedly. A little pus was however seen oozing out through the narrow opening. In order to effect a free drainage, the wound was opened out and 100 c.c. of 25% of Sulphanilamide E. O. S. was injected and spread over the wound. Thereafter, the wound was daily irrigated with a warm saline for 15 minutes and then dressed with Acriflavin gauze. The part was well covered with a layer of thick cotton-wool and bandaged. There was no improvement in this treatment. Pus was flowing out more and more every day and the animal was not using its knee. It was therefore decided to treat the wound with Penicillin. 100,000 units of Penicillin in aqueous solution were used and this was continued for six days. The wound completely healed up within a week. The dressing was discontinued but the bandaging of the knee was kept up for a few days more to protect the part.

Cases of what are commonly known as 'Broken Knee' are treated differently by different authors with varying results. The use of Penicillin in such cases appears to give us more encouraging results, although the experience from one single case should be viewed with caution. The recovery of this case within a fortnight of the commencement of the treatment is however, very significant.

ASCITIS OF THE FOETUS-CAUSE OF FOETAL DYSTOKIA IN A BUFFALO

By

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Dystokia due to ascitis of the foetus is a rare condition. In my 24 years experience, this is the first of its kind. I have met with and I would therefore like to relate my experience about it.

The subject was a she-buffalo in her third calving. She went through her full term of pregnancy and was noticed to be in pains in the early hours of 22-8-47; after a time the water-bag presented itself, ruptured after a short time, and then the fore-feet of the young one with the muzzle lying over and between them appeared at the vulva. Everything appeared to take quite a normal course, and expulsion of the foetus was thought by the owner to be only a matter of a few minutes. But, unfortunately, there was no progress for a long time. The owner, therefore, thought it desirable to effect the delivery of the foetus by traction. With the kind help of two or three of his neighbours he tried hard to pull out the foetus but met with no success. Thereupon, he decided to call me to attend on the case.

On examination, the buffaloe was found lying exhausted on her right side with a dead foetus hanging partially out of the vulva. Evidently the two front limbs and the head of the calf had been brought out with considerable difficulty. Exploration of the passage was then undertaken and it was found to be an extremely difficult task. With proper lubrication and steady manipulation, the hand was pushed along side the foetus. No abnormalities were noticed up to the end of the chest. On reaching the abdomen, it was found to be extremely tense and voluminous. The cause of the dystokia thus revealed itself as one of Ascitis of the foetus. The foetus was, therefore, retropulsed into the uterus as far as possible. In the absence of a concealed knife, a Syme's abscess knife was taken in carefully and the abdomen of the foetus was carefully punctured. Immediately, a slightly yellowish watery fluid began to flow out forcibly and the tension of the abdominal wall came to be gradually reduced. When about 3 gallons of the fluid escaped, the foetus was extracted without difficulty. The abdomen of the foetus still contained about a gallon of this fluid. The foetus was well developed and had all the attributes of a normal foetus, except that the posterior limbs were short and crooked—(*Nanomeles Compyluscelus*).

DEMODECTIC MANGE IN CALVES

By

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Six calves of the Government Dairy Farm at Khapuria, Cuttack, became affected with Demodectic Mange and these were treated with different medicaments. These are recorded in this article.

The disease was confirmed microscopically and the calves were segregated in four separate enclosures. In all the cases, the lesions were confined mostly in their order of severity, to neck, shoulder and dewlap.

1st lot:—Calf No. 13 was given Novarsenobillon intravenously. The dose was 0.15 gm. for the initial dose. Gradual increase of 0.15 gm. was given on subsequent doses. The interval between injections was 5 days. A course of five injections was given. There was improvement in general condition of the calf. Hairs began to grow on the affected parts. Still, when the materials were microscopically examined again, large numbers of demodects in their developmental stages, were seen. To avoid toxicity from N.A.B. it was decided to give rest to the animal. A second course of five injections of N.A.B. was given after a fortnight starting from 0.6 gm. The maximum concentration was 0.6 gm. in 10 c.c. of sterile distilled water. There was complete cure of the lesions. The animal was declared disease-free afterwards.

2nd lot:—Calf Nos. 14, 25 and 27 were given 3 c.c. of Acetylarsan subcutaneously on every alternate day. The strength of Acetylarsan was 0.05 gm. in 1 c.c. A course of seven injections was given to each calf with no apparent improvement. When the scrapings were examined again, they revealed mange mites. The condition of animals also did not improve. So the treatment with Acetylarsan was discontinued.

3rd lot:—Calf No. 38. Only topical application of Hydnocarpus oil with 4% Creosote was given every alternate day for a period of 2½ months. Complete recovery was effected.

4th lot:—Calf No. 68. This was given topical application and intramuscular injection of 'Hydnocreol' for a period of 1½ months at five days intervals with very satisfactory result. Condition of the calf improved to a marked degree. Hairs grew on the denuded parts of the body.

Result and observation:—Novarsenobillon is effective but its cost is prohibitive. But, in badly affected areas, especially in farm animals the cost on account of the use of the drug should not be the ruling factor. In addition to the shedding of the mangy crusts, the general condition of the animal improved with N.A.B.

Acetylsarsan was ineffective.

Topical application of Oleum Hydnocarpus with 4% Creasote is effective. It is cheap but it takes a very long time to have the desired effect.

Hydnocreol, combined intramuscular injection and topical application, is effective. It is comparatively cheaper than N. A. B. and Acetylsarsan. But where time-factor and quicker result are considered, it is not superior to N.A.B.

Finally, it is to be recorded that many calves should not be discharged as 'cured' merely by observing the general outward appearance of the crusts. A microscopical examination is necessary. It is not absolutely necessary to boil the crusts in Caustic Potash solution. The material teased with a little water on a slide reveals, on microscopic examination, the parasites.

Acknowledgement:—I wish to express my indebtedness to Mr. G. B. Singh, B.A., M.R.C.V.S., Director of Veterinary Services, Orissa, for the kind advice given in the treatment of these cases.

"HOVEN" AN EXPRESSION OF ALLERGY

By

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Adverting to the extract of the article on the above subject in the *Indian Veterinary Journal*, Vol. XXIII, No. 1 for July 1946, page 40, wherein the authors have stated that cases of Hoven in ruminants were successfully treated with one subcutaneous injection of 3 to 5 c.c. of Adrenalin without any further treatment, the following record of 16 cases treated in this dispensary will be found interesting:—

1. Case No. 753 admitted on 24-8-46. Gr. bullock, six years. Reported to be getting attacks of hoven once a week. Stomach bloated abnormally, anxious expression, difficult breathing, tongue protruded, temperature 101.4° F, bowels loose.

Treatment:—Injected Liqr. Adrenalin Tartaratus 10 c.c. subcutaneously.

Result:—Slight restlessness, flatus expelled through anus after 40 minutes. Bloating completely reduced in an hour. The animal was seen next week. The condition did not recur.

2. Case No. 800 admitted on 3-9-46. Gr. bullock, 8 years. Reported to be getting attacks of hoven once a week. Stomach bloated abnormally, anxious expression, difficult breathing, tongue protruded, temperature 101.4° F. and bowels loose.

Treatment:—Injected Liqr. Adrenalin Tartaratis 10 c.c. subcutaneously. Gave a second dose after 4 hours. No relief. Tympany persisting.

From 4-9-46 to 7-9-46, the normal remedies for Hoven like Formalin. Turpentine were tried with no success. The owner then took it home and reported it dead on the 18th.

3. Case No. 813. Ram, 3 years, admitted on 5-9-46. Ate 2 measures of cholam the previous evening. Unable to stand and was therefore carried to the dispensary. Rumen bloated to full capacity. Head down, hurried breathing, bowels constipated. Temperature 99.4 F. Lying down.

Treatment:—Liqr. Adrenalin Tartaratis 4 c.c. given subcutaneously.

Result:—30 minutes after the animal started struggling and in another 15 minutes the bloating rapidly subsided completely.

4. Case No. 866, admitted on 16-9-46. Bullock, 8 years. Animal developed the condition in the morning. Acute tympanitic condition, bowels loose, temperature 100.4 F.

Treatment.—Liqr. Adrenalin Tartaratis 5 c.c. given subcutaneously.

Result.—Condition relieved within two hours.

5. Case No. 924 admitted on 27-9-46 morning. Cow 6 years. Reported persistent tympanitic condition for a week. Rumen bloated, temperature 100.2 F bowels loose and foul smelling.

Treatment.—Gave Liqr. Adrenalin Tartaratis 10 c.c. subcutaneously another 5 c.c. after 4 hours.

Result.—Relief very delayed: condition completely relieved by evening.

6. Case No. 963 admitted on 6-10-46. Cow, 6 years. The animal was seen to 'bloat' suddenly after the morning feed. Acute tympany of the rumen, temperature 100.2 F, bowels constipated, urine scanty.

Treatment:—Liqr. Adrenalin Hydrochlor 5 c.c. injected subcutaneously. Animal relieved of the condition in an hour.

7. Case No. 1005 admitted on 16-10-46. Gr. Bullock, 8 years. Distention of the rumen since previous evening. Home treatment had been tried in vain. Condition acute, rumen bloated fully, temperature 101.4° F, bowels loose.

Treatment.—Liqr. Adrenalin Hydrochlor 5 c.c. injected subcutaneously.

Result.—Tympany slowly reduced and disappeared completely after 3 hours.

8. Case No. 1023 admitted on 20-10-46. Gr. Bullock 6 years. Tympany of two days. Condition acute, rumen bloated fully, temperature 101.4 F, bowels loose.

Treatment.—Liqr. Adrenalin Hydrochlor 5 c.c. injected subcutaneously.

Results.—Completely relieved in two days.

9. Case No. 1033 admitted on 22-10-46, bullock 7 years. Tympanitic conditions for the past 2 days. Abnormally bloated stomach. Condition very bad. Cessation of urination and defaecation, temperature 100.2 F.

Treatment.—Liqr. Adrenalin Hydrochlor 5 c.c. injected subcutaneously at 8 A.M. Repeated at 12 noon.

Result.—No appreciable change in the morning. Completely relieved by 3 P.M.

10. Case No. 1117 admitted on 9-11-46. Bullock aged. A case of recurrent tympany of the rumen. Duration 1 month.

Treatment.—10 c.c. of Liqr. Adrenalin Hydrochlor injected subcutaneously.

Result.—No relief; animal died after 2 hours.

11. Case No. 1123 admitted on 10-11-46. Cow age 4 years. Stomach was 'bloat' after the morning feed. temperature 100.2 F.

Treatment.—5 c.c. of Liqr. Adrenalin Hydrochlor given subcutaneously.

Result.—Relieved in an hour.

12. Case No. 1168 admitted on 21-11-46. Gr. bullock, 6 years. Stomach 'bloat' after the morning feed. Tympany acute, temperature 100.2 F.

Treatment.—5 c.c. of Liqr. Adrenalin Hydrochlor given subcutaneously.

Result.—Relieved in an hour.

13. Case No. 1173 admitted on 23-11-46. Bullock 8 years. Recurrent tympany on alternate days, during the past 8 days. Rumen bloated, bowels loose, urine scanty, temperature 100.6 F.

Treatment.—10 c.c. of Liqr. Adrenalin Hydrochlor subcutaneously.

Result.—Relieved in 3 hours.

14. Case No. 1183 admitted on 25-11-46. Cow, 6 years. Acute tympany, since morning anxious expression, temperature 100.4 F.

Treatment.—Injected Liqr. Adrenalin Hydrochlor 5 c.c. subcutaneously.

Result.—Relieved after an hour.

15. Case No. 1265 admitted on 12-12-46. Cow, 6 years. Animal ill for the past 12 hours. Acute tympany, anxious expression, temperature 101.4 F.

Treatment.—Injected Liqr. Adrenalin Hydrochlor 5 c.c. subcutaneously.

Result.—Relieved after an hour.

16. Case No. 1509 admitted on 28-1-47. Red bullock 8 years. Sick for the past 8 days. Rumen fully bloated, bowels loose, urine scanty, temperature 100.4 F.

Treatment.—Injected Liqr. Adrenalin Hydrochlor 5 c.c. subcutaneously. Repeated with 10 c.c. subcutaneously after two hours.

Result.—No relief after the first injection. Reduced in an hour after the second injection.

Conclusion.—From the above data it can be safely asserted that the treatment is very encouraging both in acute and chronic forms of the ailment. Case No. 2 and 10 did not respond to the treatment but died. Unfortunately postmortem could not be conducted on the dead animals.

In most of the cases the tympany subsided by the passage of flatus and eructation. All the animals were brought to the dispensary under instructions, for a second time, the next day, to see whether the condition recurred.

Association News

BIHAR VETERINARY ASSOCIATION

Proceedings of the Tenth Annual General Meeting held under the auspices of the Bihar Veterinary Association at the Bihar Veterinary College, Patna on the 28th, 29th, 30th, and 31st December, 1947.

First day, 28th December, 1947

The conference commenced at 2 P.M. on Sunday in the west Lecture Theatre of the Bihar Veterinary College. The chief guest Hon'ble Acharya Badrinath Verma, Minister for Education arrived exactly at 2 P.M. and was received by the President, Mr. S. K. Sen, the Secretary Mr. B. M. Prasad and members of the Reception Committee and conducted to the dais. The Chairman of the Reception Committee then garlanded him amidst great cheers from the members.

Mr. H. R. Kapur, Deputy Director, Civil Veterinary Department and the Chairman of the Reception Committee in welcoming the Hon'ble Minister and requesting him to declare the conference open made the following speech :—

Hon'ble Acharya Badrinath Verma, gentlemen and colleagues,

It is my great privilege to accord you all a most cordial welcome on behalf of the Reception Committee of this conference of the Bihar Veterinary Association. I feel grateful to the gentlemen who have responded to our invitation and found it possible to grace this occasion in the midst of their multifarious works. This augurs well for the future of the Veterinary profession. To you, my colleagues who have come from muffled stations I extend my hearty welcome. The Reception Committee has tried its best to make your stay here as convenient and comfortable as possible, but with scarcities of foodstuffs all around, you will, I am sure, make light of any slight inconveniences and take our will for the deed.

To you, Sir, (Hon'ble Acharya Badrinath Verma) I extend my welcome with profound gratitude for your readily responding to our invitation. Your presence in our midst, Sir, is a sure indication of your love to the dumb creatures which it has been our privilege to serve. The importance of cattle in the economy of the country is well known and they contribute the chief of wealth of the ryots. We meet here to consider not only how to preserve this wealth but to devise also ways and means of making this wealth greater in quantity and quality. While doing so we can ill afford to ignore the status of the Veterinarians who are the custodian of his vast wealth.

Since we met last, a year ago, vital changes have taken place in our country. We are no more under bondage. The governance of our country has changed hands. To our great delight we find our own trusted leaders at the helm of affairs of the country and each province with full authority to direct the administration in the best interest of the people. Naturally our Government have given first priority to the measures intended to improve the condition of the agriculturist, and rightly so, for the very important contribution they are required to make towards food production and human nutrition. To accomplish this they depend, need we stress, mainly on the livestock. They require to be protected against diseases and also to be kept in a fit state of their health to be able to render maximum service. We aim at this. We are earnest in our efforts to achieve this objective. We are striving to prepare ourselves to shoulder the responsibility and to cope with the task that lies ahead. But our attempt necessarily remains limited to the resources at our disposal. On the otherhand, the resources of the state are unlimited. Therefore we urge, a reorientation of the policy on the part of the Government to accommodate the programme of development of the different branches of veterinary science and animal husbandry in the same priority list. The democratic outlook towards veterinary profession has been lacking in the past, and this explains the reasons for the static state of our profession. This, we do not expect to continue any more in the regime of the popular Government. Our problems remain precisely the same as were enumerated by our President Mr. S. K. Sen last year. In the matter of the veterinary education we have made our wishes known to Government. We want the Bihar Veterinary College to be raised to the status of a Degree College and affiliated to the Patna University, so that the standard of efficiency is raised to the growing responsibilities awaiting a head in the field of veterinary science and animal husbandry. We want immediate introduction of the course extending over a period of four years and adoption of the syllabus prepared by the Education Committee of the Indian Council of Agricultural Research which includes veterinary science and animal husbandry and suited most to the necessities of the country. Our demand will not appear extravagant when it is remembered that most of the Veterinary Colleges in India enjoy the benefit of affiliation with Universities and are functioning as Degree Colleges. It makes us envious to see the Agricultural College of Sabour, though junior in age, functioning as a Degree College of the Patna University. The Hon'ble Minister for Development was pleased to remark favourably in his inaugural address last year. Some hopes of materialising our demand were raised by the sanction of a few post of assistants in this college. Yet we have not proceeded far from the place where we stood last year. Therefore we insist in our request and I trust you Sir, to help realisation of our aspirations as the Hon'ble Member of the Cabinet and Minister of Education.

Next our problem relates to the measures of cure and control of diseases of livestock. While we feel the need for increasing the number of Veterinary Officers and institutions to cope with this work, we feel more the need for a central institution in this province for investigating the cause and cure of many diseases which still remain obscure. Such diseases are responsible for large mortalities among livestock. The losses are indeed immense. I would therefore suggest for the earnest consideration of the government, that the staff engaged in disease investigation and in work of like nature in different laboratories of the province be organised and co-ordinated to provide a nucleus for such research institution in this province. It will then provide an opportunity for the local talents to grow and develop ultimately into a Central Research Station. This suggestion therefore deserves consideration.

We have often complained that the meagre salary offered to Veterinary Assistant Surgeons does not attract men of higher qualification to take up this profession. With the soaring prices of all commodities, the salary of the Veterinary Assistant Surgeons falls short of a living wage. This has resulted naturally in the paucity of Veterinary graduate so much so that despite re-employment of retired officers, many of the dispensaries are without a full time Veterinary Assistant Surgeon. The truth of our long standing complaint has never been brought home more vividly than this state of affairs. Yet the Bihar Pay Commission have been pleased to recommend to us very much less than that offered to our brother in the Punjab, Madras, Bombay and U. P. How far this revised scale will go to induce the right type of young men to choose this profession only future will tell. We however have no manner of doubt in our mind that even if it succeeds to increase the quantity it will fail surely to increase the quality.

The gloomy prospects in the department to which we all belong is another impediment to progress. The gloom is not due merely to the lack of opportunities for a 'lift' but also due to the fact that even the few available superior posts are "reserved" posts and not open to men with approved service.

Under such a condition even those officers who have developed efficiency by experience will naturally fail to grow despondent. I will not be surprised if they loose their heart in work also. This is no impeachment. I have mentioned the problems which confront us to day. We have to consider the solution. We seek your guidance how to approach the problems by right ways. Your presence amongst us today inspires the hope that we will have your support and blessing for all time and that we will succeed in our efforts.

The Hon'ble Acharya Badrinath Verma then declaring the conference open made the following speech in Hindi.—

Members of the Reception Committee and gentlemen,

I must first of all thank the members of the Bihar Veterinary Association for the honour they have done me in asking me to perform the inaugural ceremony of the Tenth Provincial Veterinary Conference. When I received your invitation I thought of refusing it as I do not happen to know any thing about your department and the veterinary science, but it immediately occurred to me that if I do so, I would not only disappoint you but also deprive myself of the opportunity of coming in contact with members of the veterinary profession who must be assembling here from all over the province and making a preliminary acquaintance with the methods of the working of the veterinary department and some of the pressing livestock problems. I have therefore come here to learn during my short association with you, the improved methods of cattle keeping. You should not expect from me any speech nor be surprised if you feel disappointed in not getting any assistance from me in your deliberations on technical matters. Because it is customary to say something on an occasion like this, I will just speak to you a few words.

The Chairman of the Reception Committee has expressed strong disapproval of the scale of pay recommended by the Pay Revision Committee for the Veterinary Assistant Surgeons. It also appears to me that the pay is not commensurate with the nature of the duty and responsibility attached to the work. I was also a member of the Committee and I cannot escape the responsibility of the injustice done to you. The recommendations of the Pay Revision Committee are not binding on the Government, and in fact Government have not finally accepted them. And therefore you can press your claims and I as a member of the Cabinet assure you to help you as far as lies in my power to gain your objective. (Cheers)

Cattle have a great importance in our economy of life. We need milk and need it more than other people of the world because there is a large proportion of our population which does not eat meat. It is mainly on account of inadequate milk supply that the percentage of infant mortality in India is very high and the average life of an Indian much less.

India is principally an agricultural country. More than 70 percent of its population lives on agriculture and it is no exaggeration that it is mainly on the livestock that the agriculture of the country can flourish. We therefore need strong bullocks for ploughing the land, for lifting water for irrigation and for rural transport. Unlike other countries we have in India a peculiar system of land tenure and there is no appreciable chance of mechanisation replacing the bullocks as the chief source of power for agricultural purposes.

We have therefore to depend on a dual purpose kind of animal, the males of which are capable of meeting the agricultural and transport needs of the country whilst at the same time, the females can be expected to yield reasonable quantity of milk. It has been found by experience that Punjab animals which are undoubtedly superior breeds, do not flourish in changed locality and it is therefore necessary to find out the potentialities, both in regard to milk yield and draught purposes of local cattle and improve them by judicious and selective breeding. The Veterinarians in this province have a two-fold duties to perform i.e. to produce improved and healthy cattle for better cultivation and production and good milch cows for milk purposes. You should endeavour to achieve permanent improvement. With the advance in the knowledge of animal husbandry and veterinary science, you should be able to develop breeds suited to our purposes within a reasonable short time.

I appreciate your anxiety to immediately raise the standard of veterinary education in Bihar to that of a degree course. In fact Government is seriously examining the possibilities of providing the highest training in all branches of science in this country so that many people may be trained at a time at a much lower cost and our youths may not have to go to foreign countries for such things. On going through the proceedings of your last annual general meeting it appears that my colleague Dr. Mahmud informed you that he has recommended for the affiliation of the Bihar Veterinary College to the Patna University. As he is out of station, I have not been able to contact him and know how the matter stands; but I assure you that it has not disappeared from his mind. It is possible that on account of more important State work he may not have been able to give the same amount of attention that the subject needed. I as Minister in charge of Education express my preparedness to extend help and support in the matter.

I thank you once again for the honour you have done me by inviting me to your conference and for the patience and tolerance with which you have heard me. I declare the conference open and leave you to deliberate on the important questions that confront your noble profession and take firm decision to enhance the value of the dumb cattle by application of your noble science.

After this Mr. S. K. Sen occupied the Presidential Chair amidst great applause and delivered his presidential address:—

Hon'ble A charya Badri Nath Verma and Gentlemen,

I would very much like to have spoken today to you in Hindi but I must admit that I have not yet attained sufficient proficiency in that language to enable me to address distinguished gathering like this. I am

therefore speaking in English which is, so to say, the common language of the scientist all over the world.

First of all allow me to extend my hearty welcome to you all to the 10th meeting of the Bihar Provincial Veterinary Association, a body which represents the entire veterinary profession in Bihar and also others who have joined us in our efforts to improve and preserve our livestock and to enrich the country. To those who, through the exigency of public service or for unavoidable reasons, have not been able to be present, I express my sympathy.

We are extremely grateful to Hon'ble Acharya Badri Nath Verma, Minister for Education for accepting our invitation to inaugurate the conference, in spite of his heavy engagements and important duties that he has to perform. His presence here today will enable us to apprise him of our old demand for higher education in Animal Husbandry and Veterinary Science, to which I will refer later on.

Gentlemen, in my last address I spoke on the increased responsibility which developed on us for augmenting the tempo of agricultural and food production in the New Free India. India at present is importing a large quantity of cereals and other foodstuffs from abroad at an enormous cost, and it is for us and those who are engaged in agricultural work to devise means and plans to enable people in the country to produce enough for themselves and also for export. The Department of Agriculture and Food in the Central Government, under the efficient guidance of Hon'ble Dr. Rajendra Prasad, have fully realised their responsibility in producing food and feeding India's teeming millions. Dr. Rajendra Prasad's keen interest and anxiety for the speedy development of the Animal Husbandry in this country is well known. Unless the provinces keep pace with its fast moving centre and work in collaboration and co-ordination there is bound to be dislocation and disaster in regions which are backward and not organised. Now that the period of struggle for freedom has ceased, we have entered a new era, in which construction and development must begin in all spheres of human life. Our profession will have to play an important role in the new set up of social and economical structure for the economic development of the country. I wish to warn you, Gentlemen, before hand that if we do not realise our responsibilities and hard task ahead of us and do not equip ourselves to be ready to shoulder the burden which our profession is to take, our present weak and artificial foundation will completely disappear or collapse. Main task before us is varied and many. Starting from the protection of animals from the ravages of enzootics, their maintenance in health, increasing the production of livestock commodities by 100 to 300 per cent, producing more milk, butter, ghee, eggs, poultry, meat, wool and various other protective foods and producing

more bullocks for transport and agricultural work, the modern Veterinarian has got a great obligation to discharge in the maintenance of human health and nutrition. In order to do our work more efficiently, it is necessary to raise the standard of veterinary education and training in animal husbandry in this Province. The Bihar Veterinary College which was set up in 1930 is the only College now, except Bengal which has still a three years course ending in diploma. All the old colleges in Madras, Bombay, Lahore and the new colleges in Central Provinces and U.P. have started with a degree course. At the last meeting we had an assurance from Hon'ble Dr. Syed Mahmud that the affiliation of the Veterinary College to the Patna University for raising the standard to the degree course was recommended by him and now we want to see the recommendations materialise and bear its fruit. We hope the Hon'ble Minister for Education who is entrusted by the people of this province for giving facilities for all types of education, will do his part in getting this College affiliated to the University as soon as possible.

Veterinary Education like other technical education cannot be divorced from other scientific studies. The water tight compartments created in the administration of technical institutions is harmful and detrimental to the growth and development of mutual intercourse amongst men engaged in different sciences and technology. Therefore, I feel that it is essential that subjects of pure science common to various colleges, viz. Medical, Engineering, Veterinary etc. should be taught at one place, so that students may get chance to know each other and develop a spirit of fellowship. An atmosphere for research and thirst for knowledge can only be created, if men pursuing different sciences are put together or often meet as they do, at the meetings of the Indian Science Congress. This close contact makes people realise their deficiency and the desire to improve. In this connection, I refer here to a proposal of shifting the Veterinary College from Patna to Sabour in Bhagalpur. The proposal has been made with the object of putting both Agriculture and Veterinary Colleges near each other. Although there may be some advantage in having both these two colleges situated side by side, the Veterinary Education in a place like Sabour will be incomplete without adequate hospital and clinical practice, where animal population is not so dense. Besides these beautiful buildings which were specially constructed to serve the purpose of giving veterinary training, will hardly be of any use to colleges and the cost of construction of such buildings will now be prohibitive.

The Post War Reconstruction plans of Animal Husbandry in this province have now received sanction of Government. Although the schemes are of exploratory nature and limited scope, yet it is possible to show how quickly improvement can be affected, if scientific methods are applied in Animal breeding, milk production, animal nutrition, manage-

ment of pastures, poultry development, and the development of smaller animals. The most important factors which will eventually contribute to the success of these developmental plan are joint efforts and hard work of our profession and other qualified men who are to be engaged in this task. We need a large number of qualified men for running these schemes, and for that Purpose Government have recently increased the number of admission of students from 45 to 80. The response from suitable young men of this province in regard to admission in this college has been, on the whole, very poor. The main reason for this poor response, as I told you last year, is the poor future prospects that are held out to all those who want to enter this profession. Unless the scales of pay are made more attractive, I am afraid the profession will not be able to attract suitable men. The entire outlook in the modern livestock production has completely changed and the need for scientific study of problems in animal husbandry is being felt day by day. Today the veterinarians and those engaged in animal husbandry work in India cannot stand aloof from other scientific workers. To be on the same level with others, we must recruit the best available talents and first class scientific men, like chemists, statistician, zoologists, technologists etc. for advancing our knowledge in animal nutrition, genetics, dairying, animal diseases, and associated technological studies. These men through their researches and investigations should be able to help the profession to preserve animals in health, produce more milk, increase the fertility of livestock and productivity of wool, eggs etc. Without research no development is possible in any branch of technical work. In the Veterinary and Animal Husbandry activities there is plenty of room for research and investigation. Results of research done in Europe and America cannot be accepted for application in India without verification and test. At present no research is being carried on in this College laboratory or in the Department. The Disease Investigation Officer's work is limited in scope and nature. It is desirable to recruit suitable men with bias for research and pay them well. These men can then be entrusted to solve different local problems which are of greatest importance to the country. By developmental research we mean the investigation which contemplates the verification and the benefit of the Industry or Agriculture. In India, where facilities for doing fundamental research is limited, much stress should be given to the developmental research. In order to meet, and interchange thought with research workers and eminent scientists, the Veterinarian should actively participate in gatherings like Indian Science Congress, in which there is a Veterinary and Medical Section. The Science Congress is holding its session this year in Patna and I hope many of you will stay on here to attend the Veterinary Section of the Congress.

The Pay Revision Commission, which has recently completed its most difficult task, recommended certain scales for Veterinary Surgeons, Inspectors and other higher officers. The commission's recommendations

however, fall short of the expectation of the Association. Although we fully realise that the scales of pay should be proportionate to the general standard of living and should be commensurate with the provincial revenues, we demand that the scales all over India should be more or less on a uniform basis, otherwise, the standard of efficiency will suffer. We fully appreciate the hard work the commission had to do in order to bring all posts into a limited scale of pay ensuring nationalisation and uniformity to the fullest degree possible; but I am afraid the pay offered will fail to encourage the desired type of young men to take up this profession. There is, therefore a necessity of not only increasing the scales of pay but also of prospects as well, for unlike other services the veterinary service is a specialised service, and one has to look for betterment of condition in the Veterinary department only.

I do not wish to try your patience any longer. Before I conclude, I would like to say a few words to my young friends in the profession. You have all a great responsibility to discharge and each one of you should endeavour to equip yourself by further studies and keen observations in the field so that you may be able to enhance your reputation and add to the efficiency of the service to which you belong.

I thank once again our chief guest for very kindly accepting our invitation to open the conference.

Mr. H. R. Kapur then rose to propose a vote of thanks to the chief guest and visitors and in doing so spoke as follows in Hindi :—

Hon'ble Acharya Badrinath and Gentlemen,

It gives me great pleasure to propose on behalf of the Members of the Bihar Veterinary Association, a vote of thanks to you for readily accepting our invitation and for the trouble you have taken to come here this afternoon to perform the inaugural ceremony. We all know that till yesterday you were confined to bed on account of indisposition and therefore your presence amidst us today is a testimony of your love towards the veterinary profession and it has filled us with gratitude. This is a plain truth Sir, that in these days a Veterinary Graduate is paid less than a labourer. When I say this I do not mean that I despise labour but I do think that we also should be paid adequately to keep ourselves in comfort and free from wants. This is a legitimate demand. I express my thanks to you Sir, for your promise to help us in the realisation of our aspirations. It has not yet, however, raised in us the desired amount of hope and expectation as we suffer from a sense of pessimism. Similar promises were made year after year on this very platform and in this very hall by Advisers, Ministers, Secretaries and Vice-Chancellor and yet, I feel constrained to state that we find ourselves exactly in the same place where we were before.

Therefore our only consolation is that with the dawn of a new era and with our own men at the helm of Government there is bound to come a change in the whole outlook and, before long, our profession will be placed in a position it so well deserves.

I thank the Principal, Bihar Veterinary College for allowing the use of the College building and the hostel and for his hearty co-operation.

Again on behalf of the Association I offer my thanks to you all for honouring us by your presence to day.

The day's programme ended at 4.30 p.m.

The following members of the Association attended the conference :—

1 Mr. S. K. Sen, 2 Mr. H. R. Kapur, 3 Mr. P. B. Kuppaswamy, 4 Mr. M. A. Rahim, 5 Mr. R. Y. Panday, 6 Mr. R. J. Singh, 7 Mr. B. Narayan II, 8 Mr. S. N. Sharma, 9 Mr. R. B. Singh, 10 Mr. R. D. Singh II, 11 Mr. B. N. Sinha, 12 Mr. B. M. Prasad, 13 Mr. R. B. Prasad, 14 Mr. S. A. R. Akhtar, 15 Mr. S. M. Ishaque, 16 Mr. G. Prasad, 17 Mr. R. P. Mahrotra, 18 Mr. K. D. Narain, 19 Mr. D. N. Sahai, 20 Mr. P. C. Kunar, 21 Mr. R. B. P. Sinha, 22 Mr. J. K. Singh, 23 Mr. R. L. Sinha, 24 Mr. B. Narain I, 25 Mr. B. D. Roy, 26 Mr. Tribeni Singh, 27 Mr. A. K. Mukherji, 28 Mr. S. K. Chatterji, 29 Mr. A. B. Mukherji, 30 Mr. K. L. Baxi, 31 Mr. R. P. Singh, 32 Mr. A. Lall, 33 Mr. N. D. Singh, 34 Mr. V. N. Singh, 35 Mr. K. A. Sankram, 36 Mr. S. A. Hussain, 37 Mr. V. N. P. Singh, 38 Mr. S. M. Hussain II, 39 Mr. S. M. Hussain III, 40 Mr. M. Naimuddin, 41 Mr. Q. Khan, 42 Mr. A. K. Varma, 43 Mr. H. D. Afgani, 44 Mr. R. K. Singh, 45 Mr. N. S. Sinha, 46 Mr. N. S. S. Varma, 47 Mr. S. Huda, 48 Mr. S. M. Moosa, 49 Mr. S. Mohammad, 50 Mr. R. K. Ram, 51 Mr. R. N. Singh, 52 Mr. K. P. Jaiswal, 53 Mr. B. P. Varma, 54 Mr. B. Dey, 55 Mr. H. K. Roy, 56 Mr. R. N. Chaudhury, 57 Mr. J. P. Singh, 58 Mr. R. C. S.C. Prasad, 59 Mr. R. R. Sinha, 60 Mr. S. S. Ahmad, 61 Mr. H. Prasad, 62 Mr. Deobans Prasad, 63 Mr. R. A. Prasad, 64 Mr. Chatturbhu Sinha.

Telegrams and letters were received from several members regretting their inability to attend the meeting and wishing success for the conference.

The conference was attended by some distinguished persons of the city and also by the staff and students of the Bihar Veterinary College.

Second day 29th December, 1947

The second day's proceedings commenced at 9 A. M. with Mr. S. K. Sen in the chair. The Secretary presented his report for the period from 2nd January to 28th December, 47, for discussion and adoption. The report read as follows:

The report of the Association which I have the pleasure to present covers the period from 2nd January, 1947 up to date.

This is the first time after India attained freedom that our Association is holding its annual general meeting. This is a great occasion for us all and let us all rejoice over it.

After the last annual conference, during the period under report, the Managing Committee met five times. At times it was necessary to meet at short notice to take quick decision over matters which directly concerned the interest of the profession and of the members who form its back bone.

In narrating some of the most important activities of the Association, I would request you all to refer to the resolutions passed at the last general meeting without which it would not be possible to review them properly. You all must also be eager to know the actions taken in regard to them.

All the resolutions were forwarded to Government with explanatory notes in due course. In resolution No. II, Government were moved to accept the amended by-laws of the association. After reminders were sent by me to Government, the Secretary for Development called me to his office in the first week of this month for discussion on the new bye-laws. He desired to know the means the association would provide for the advancement of Animal Husbandry and Veterinary Science and arts; and necessity of extending the membership of the association to persons with a light qualifications of the Animal Husbandry Department. Both these points were explained by me and no further discussion took place. I was expecting a letter of government approval but surprisingly enough, the Secretary in his last letter on the subject desires me to re-draft some of the rules and resubmit the new bye-laws. I have since requested him to suggest amendment which he has in mind, to enable me to place the same before the general body as nothing was pointed out to me in the course of the discussion. Although I have informed him of the dates of the conference no reply has been received as yet.

In regard to resolution No. IV urging Government to prescribe the interim time scale of pay according to the length of service of individual members, repeated requests were made to Government for immediate consideration and orders. The subject was also discussed in the first committee meeting and according to the decision taken in that meeting a deputation of several members waited upon the Hon'ble Minister for Finance who gave us a patient hearing and promised to look into the matter. He also desired us to furnish him with a copy of our letter to the Development Minister forwarded along with the resolution. This was done but up till now nothing is known. I also saw the Deputy Secretary of Finance in this connection but that also has not been of any help. While the Finance Minister readily agreed to hear us, I regret to

have to say that all our attempts to see the Hon'ble Minister for Development in connection with the same subject failed; since every time, I approached the private secretary with the request to fix some time to receive the deputationists the only reply was that the Hon'ble Minister was occupied in some more important work. In a similar manner we failed to see the Hon'ble Premier and therefore I am not in a position to say anything further on the subject.

In resolution No. VII, the Government were moved to designate the present Veterinary Inspectors as District Veterinary Officers and place them in Class II service. The question is under their consideration and in the meantime the Government desired us to let them know what actions are being taken by other provinces in the matter. All the provinces have been addressed and their reply is awaited. The Director, Veterinary Services, Bihar has also been furnished with a copy of relevant extract from the recommendations of Royal Commission on Agriculture in India (1928) in connection with the above.

In resolution No. VIII we demanded abolition of the professional examination and am glad to announce, although most of you must now be knowing it, that the Government have been pleased to abolish the quinquennial professional examination of Veterinary Inspectors and Veterinary Assistant Surgeons.

In resolution No. IX, we moved the Government to replace the present fixed T. A. by general system of Travelling Allowance. The government wanted detailed informations as to the rate obtaining in other provinces in India. Necessary information has been collected and furnished. I also discussed the matter with the Under Secretary, Development and have reason to believe that our prayer will receive their sympathetic consideration and a decision may be available soon.

According to resolution No. XII, the Executive Committee selected the President and the Secretary to represent the Association to the Pay Revision Committee. The representatives met the Committee on 10th Sept. 47 and placed before them the whole case in an appealing manner. Their recommendations are contained in the report which came out on the 22nd Nov. 47. In an extraordinary meeting of the Executive Committee, the report was considered, modifications were suggested and anomalies pointed out, after a thorough discussion and concurrence of the members present. Every member of the Association has been supplied with a copy of both. (Pay Revision Committee's recommendations and Association's modification) for his information.

In resolution No. V, passed in the Committee meeting held on the 15th Oct. 47, it was decided to wait upon a deputation on the Development Secretary and the Director, Veterinary Services to impress upon them the necessity of forwarding the applications of suitably qualified persons of this Department for any better post in the province. The necessity of this resolution arose from the

fact that recently two posts of Livestock inspectors in the scale of Rs. 125-9-170 were advertised by the Animal Husbandry Department and some members of the Association possessing requisite qualifications applied. But their applications, it seems, were held up by the Department, presumably on the ground of shortage of staff. Accordingly a deputation waited upon the Secretary, Development on the 10th Dec. 47, and appraised him of the urgency of the situation and offered constructive proposals to meet the emergency. The Secretary appreciated our demand as just and promised to communicate his decision before the 20th of Dec. 47. I rang him up on the 19th and was told that he had not come to any decision then but thought to arrive at some decision by 22nd Dec. positively. I have since tried to get him on the phone but he is out of station and nothing is known in the matter as yet. The Director, Veterinary Services, has considered it fit to keep silent over the point for reasons best known to him.

Other resolutions are pending with the government. In addition to these most important and vital subjects the Association during the period under report, passed many other resolutions and suitable actions were taken in all cases. To quote only one, the Committee in their meeting held on 25th Nov. 47, considered about the vacancy in the post of the Resident Surgeon, attached to the Bihar Veterinary College, consequent on the resignation of Mr. A. A. Khan, and lost no time in requesting the government to fill it by promotion of a senior man from the Department, as is usually done in the appointment of Veterinary Inspectors.

Besides these, the Association has tried to keep itself in touch with the activities of other similar organisation.

I along with Mr. Kuppaswamy attended a meeting of the representatives of the provincial service association on the 3rd. Dec. 47, convened for the purpose of examining the possibilities of starting a provincial service federation to guard the common interest of officers belonging to the provincial service. I placed the subject before the Executive Committee meeting to consider the desirability of our Association, which represents the interest of all three classes of service, joining the federation. The committee decided to set aside the question at present.

I attended another meeting of the representatives of all service Association held on the 10th Dec. 47, organised under the auspices of the Secretariat Ministerial Association, to make recommendation to government both in respect of pay and dearness allowance as an interim relief, to all Government servants, pending finalisation of the recommendations of the Pay Revision Committee. I have not incorporated the draft resolution in my present report but it is available for scrutiny by the members.

Resolution No. V, brings me to the vexed question of payment of subscription by members. The energy of the members of the Executive Committee

and expenditure involved in formulating methods for realisation of dues, could be very well utilised in more useful directions in advancing the cause of the Association if all the members develop the desire to make prompt settlement. At least 5 or 6 appeals and reminders have been issued at a cost of Rs. 50/- but the response has not been to our expectations. There are several defaulters still as will appear from a list that is hung up on the notice board. The annual subscription should be considered as an annual premium for a service bonus and paid up at the very first call.

Last year, we considered ourselves fortunate as the Hon'ble Minister for Development in his inaugural address assured us of his best endeavour to sympathetically consider all our proposals. His assurance raised in us high hopes and great expectations but I am so sorry to have to say that the authorities do not appear to have been able to take encouraging steps and consider our proposal with the speed they deserve on account of urgency. The Hon'ble Minister also said that as interim measure to accelerate the pace of progress "Salhoutries" should be given training for five to six months by the Veterinary Department so that they may be in a position to perform vaccination and other minor treatment of animals without doing harm to them. He invited suggestion from the Association when the scheme was ready for examination. I understand, that a scheme has already been drawn up and the first batch of trainees selected. If the Association was given the opportunity to express its views on the scheme, it would certainly have offered some constructive suggestions and helpful criticisms. The Association does not know the detail of its working, but from the little information it has been able to gather, if true, the scheme is likely to uncompromise the status of the Veterinarians and the objective for which it has been initiated will remain unfulfilled.

In conclusion, I would like to say from my experience that the Association will have to face many difficulties at every stage of its progress, but I assure you all that it will be able to survive, all the blasts of adversity and maintain its identities and usefulness, if it continues to get your full co-operation in its struggle for the just cause.

I think I shall be failing in my duty if I do not express my thanks to the members of the Executive Committee for their ungrudging help in the discharge of my duties. To the President, I am specially indebted for his wise counsel and able guidance whenever sought.

I hope you will forgive me my short-comings if any in my capacity as Secretary.

The following is the statement of income and expenditure for the year 1947 duly audited by Mr. H. K. Roy.

STATEMENT OF ACCOUNTS.

Credit.			Debit.		
	Rs.	A. P.		Rs.	A. P.
Deposit in Imperial Bank ...	421	3 0	Printing charges ...	79	12 0
Deposit in Saving Bank ...	7	14 0	Typing charge ...	29	3 0
Cash in hand ...	196	9 9	Stationary ...	6	12 9
Subscriptions ...	538	0 0	Cost of typewriter ...	128	0 0
Withdrawn from Saving Bank ...	103	0 0	Postal stamp ...	40	0 0
			Miscellaneous ...	1	8 0
			Deposit Imp. Bank	421	3 0
			Do. in Saving Bank	357	14 0
			Cash in hand ...	202	6 0
				1266	10 9

H. K. Roy,
Auditor, 27-12-47.

B. N. SINHA,
Treasurer.

After the report was adopted the House proceeded to discuss resolutions, but as they were fairly numerous, it was considered expedient to entrust the thing to a special committee to examine, re-draft and present them to the general body. Accordingly Messrs H. R. Kapur, G. Prasad, P. B. Kuppaswamy, A. K. Varma and B. M. Prasad were elected by the members to constitute the resolution committee. The conference broke at 10 p.m.

In the afternoon the members spent their time in the MAY & BAKER'S Stall which was specially put up for the occasion. Messrs Das Gupta and Banerjee of the firm of MAY & BAKER (INDIA) LTD. explained to the delegates and visitors every thing in relation to the products the firm had put up in the show and booked orders for supply. It was a very interesting and educational item and was greatly appreciated by all the members. It was the first of its kind on the occasion of Veterinary Conference in Bihar and members who are stationed in rural areas were immensely benefitted. With this the Second Day Session was over.

3rd Day 30th Dec. 1947.

The conference met at 9 a.m. under the Presidentship of Mr. S. K. Sen. The modified resolutions were taken up one by one for consideration. After a lively discussion they were finally adopted by majority of votes.

The conference re-assembled at 2 P. M. The election of the office bearers and members of the Executive Committee for the new year then took place. Mr. S. K. Sen having tendered his resignation a month back on account of pressure of official work in the newly started Animal Husbandry Department, Mr. H. R. Kapur was unanimously elected as the President for the year 1948.

The following were elected to the various posts by majority of votes :—

Mr. H. R. Kapur—*President*
 Mr. Q. Khan—*Vice-President*
 Mr. B. M. Prasad—*General Secretary*
 Mr. K. S. Sankaran—*Joint Secretary*
 Mr. B. N. Sinha—*Treasurer*
 Mr. R. B. Prasad, }
 Mr. P. C. Kunar, } *Members*
 Mr. G. Prasad, }
 Mr. A. K. Varma, }
 Mr. H. K. Roy—*Auditor*

The business terminated with a vote of hearty thanks to the outgoing President. After this all the members paid a visit to the stall of MAY & BAKER and spent sometime there.

4th Day 31st December, 1947

The 4th Day's proceedings commenced with the a practical demonstration of the efficacy of "Intraval Sodium" (Soluble Thiopentone B. P.) as a short duration anesthetic for dogs, by B. M. Prasad of the Bihar Veterinary College. The drug was supplied by the manufacturers—MAY & BAKER as free sample. After this the gathering assembled in the college hall with Mr. Sen in the chair and spent the morning in discussion on professional subjects.

1. Mr. P. B. Kuppaswamy, D.I.C., Bihar gave an interesting discourse on the treatment and prevention of common helminthic infestations of the domesticated animals in Bihar.

2. Mr. R. B. Prasad, read a paper on "Bovine Mastitis" which was based on his personal observations in regard to incidence, methods of diagnosis of both latent and clinical forms, treatment and prevention, in many hundreds of cases encountered during the course of investigation under the Mastitis Scheme. The lecture was very interesting.

3. Mr. R. L. Malhotra read a paper on "The Utility Cattle Breeding Problems of rural Bihar".

All the members present evinced great interest and spent a busy morning. The meeting dispersed at 1 P. M.

In the afternoon a group photograph of the members was taken and all of them were treated to a tea party in the common room of the Post Graduate Hostel.

RESOLUTIONS

Resolutions passed at the tenth annual general meeting of the Bihar Veterinary Association held on 30-12-47.

1. This meeting places on record its sense of profound sorrow at the passing away of the late Babu N. N. Ghosh.
2. Resolved that Government be moved to institute a Board for Selection of candidates for training abroad and in India in Veterinary and Animal Husbandry science. The Board should contain besides others; the Hon'ble Member, Head of the Department, one representative of the Association and an expert in the subject. Every officer, irrespective of age and period of service, should be allowed to compete.
3. Resolved that Government be moved to provide all the Veterinary Hospitals with a compounder and every dispensary with a dresser.
4. Resolved that Government be moved to provide all the Veterinary Hospitals with a microscope and other necessary equipment for quick diagnosis.
5. Resolved that Government be moved to bring into force with immediate effect the practice of co-opting a veterinary officer to attend the meetings of the District Boards and Local Bodies.
6. Resolved that Government be moved to change the designation of Veterinary Assistant Surgeon and Touring Veterinary Assistant Surgeon to Veterinary Surgeon and give all facilities to the latter at present enjoyed by officers in charge of veterinary hospitals.
7. Resolved that since the present inflation has increased the cost of living and treatment, the rules governing the scale of fees laid down in the Civil Veterinary Department manual, should be abolished. The members of the Association are expected to charge reasonably as professional fees.
8. Resolved that the following be added to the duties of the Secretary and the bye-laws amended.
 "He can approach any person, official or non-official and discuss matters in connection with the development and progress of the Association. He is empowered to grant press interviews and issue press statements in the interest of the Association."
9. Resolved that Government be moved to request the authorities concerned to allow free occupation of the P.W.D. and D.B. Inspection Bungalow to all veterinary officers, gazetted or non-gazetted, when on public duty.
10. Resolved that in order to enable the Veterinary Inspectors to devote more time towards professional work, they should be provided with a clerk to carry on the office work which keeps the officers hard pressed.
11. This Association take note of the advertisement made by the Bihar Government through the Joint Public Service Commission for the post of Deputy Director in class I Bihar Veterinary Service and regret to observe that the terms of advertisement entirely exclude the veterinary graduates of the Indian Colleges. This, the Association feels is not justifiable in view of the fact that such graduates have held this post successfully in this province and also in view of the conditions obtaining in other provinces of India, wherein

Veterinary Graduates of Indian Veterinary Colleges have held and are at present holding not only similar posts but also the posts of Director, Veterinary Services and Principal of Veterinary College. It is therefore "Resolved that Government be requested to reconsider the terms of advertisement and make suitable modifications to make the Graduates of Indian Veterinary Colleges, eligible to apply for the post."

12. Resolved that as in some other provinces in India, all gazetted posts in the Civil Veterinary and Animal Husbandary Departments in this province should be filled in by people of the province through the medium of the Public Service Commission.

Bihar Veterinary College,
PATNA.

B. M. PRASAD,
Secretary,
Bihar Veterinary Association,

BIRBHUM DISTRICT VETERINARY CONFERENCE.

Proceedings of the Birbhum District Veterinary Conference held at the Sadar Veterinary Hospital at Suri, on the 26th February 1948 at 11 a.m.

Members present:—Messrs. N. C. Biswas, J. P. Sen, A. N. Guha, H. K. Sen, B. M. Sen, A. N. Choudhury and S. M. Dhar.

Mr. N. C. Biswas was voted to the chair.

The proceedings commenced with observation of two minutes silence, in memory of Mahatma Gandiji.

1. Confirmed the proceedings of the last meeting of the Birbhum District Veterinary Conference, held on 18-1-48 at Suri.

2. Mr. S. M. Dhar, District Veterinary Officer, Birbhum, informed the members that as resolved in resolution No. 5 of the Birbhum District Veterinary Conference held on 18-1-48, orders had been placed for the following journals for Birbhum Veterinarians—the Indian Journal of Veterinary Science and Animal Husbandry, Indian Farming, Indian Veterinary Journal and Indian Poultry Gazette.

3. Resolved to fix the annual subscription at Rs. 4/—(instead of at Rs. 6 as decided on 18-1-48) and to request the members to pay the amount in advance.

4. Resolved to hold the next meeting in Rampurhat sub-division and to request the District Veterinary Officer to fix the date and time of the meeting and intimate the members in time.

5. Resolved to forward the resolutions to the press (Amrit Bazaar, Hindusthan Standard and to the Indian Veterinary Journal.)

In addition to the above resolutions, an informal discussion on various matters of professional interest, especially on Sterility in cows, took place in which a number of Veterinary Assistant Surgeons joined. Some practical

suggestions on the departmental activities and the difficulties encountered in carrying them out were also discussed with the District Veterinary Officer who promised to go into them.

With a vote of thanks to the Chair, the gathering dispersed.

Suri, } N. C. BISWAS,
26th Feb. 1948. } *Veterinary Assistant Surgeon, Suri,*
 } *Chairman.*

College News

List in order of merit of the Students who have passed the
Diploma Examination of the Bengal Veterinary College
during the session 1947-48.

- | | |
|--------------------------------------|--------------------------------------|
| 1. S. M. Abbas, U. P. (Govt) | 21. R. K. Thapliyal, U. P. (Govt) |
| 2. G. D. Das. (Baster Stree) | 22. G. B. Mandal, Bengal |
| 3. H. G. Sen. Bengal | 23. { Md. Jainuddin Bengal |
| 4. R. K. Sundram, Bengal | { Md. Wasi, U. P. (Govt) |
| 5. Md. S. Ahmed, Assam (Govt) | 24. W. J. Hool, Ceylon |
| 6. S. K. Pramanik, Bengal | 25. A. K. Acherjee, Bengal |
| 7. K. P. Srinivastava, U. P. (Govt) | 26. A. K. G. Mahiuddin, Bengal |
| 8. S. S. Majumdar, Bengal | 27. S. N. Sen Gupta, Bengal |
| 9. { B. B. Misra, Orissa (Govt) | 28. P. K. Mookherjee, Bengal |
| { K. N. Banerjee, Bengal | 29. S. C. Misra, Orissa (Govt) |
| 10. A. M. Quarshi, Hyderabad (State) | 30. { D. K. Roy, Bengal |
| 11. T. P. Singh Varma, U.P. (Govt) | { J. C. Shome, Assam (Govt) |
| 12. B. B. Bhattacharjee, (Bengal) | 31. G. P. Srinivastava, U. P. (Govt) |
| 13. { N. B. Mutkherjee, Bengal. | 32. N. M. Lingu Gouda, Mysore |
| { S. D. P. Kala, U. P. (Govt) | (State) |
| 14. J. L. Roy, Bengal. | 33. S. Saha, Bengal |
| 15. G. N. Gangana, Mysore (State) | 34. { N. P. Saha, Bengal |
| 16. K. K. Mukherjee, Orissa (Govt) | { S. N. Neogi, Bengal |
| 17. S. K. Sinha, Bengal | 35. K. Lall, Alwar (State) |
| 18. R. Madhusudan, Hyderabad | 36. J. N. Ganguli, Bengal |
| (State) | 37. G. P. Dey, Bengal |
| 19. P. C. Roy, Bengal | 38. { K. Ballav, U. P. (Govt) |
| 20. { S. P. V. Narshu, Orissa (Govt) | { S. C. Bara. Assam (Govt) |
| { D. D. Ghose, Bengal | 39. G. C. Bag, Bengal |

Calcutta }
3-5-48. }

Principal,
Bengal Veterinary College.

BIHAR VETERINARY COLLEGE, PATNA

List of successful final year (Diploma Examination) students according to merit.

Sl. No.	Name	Name of Government or District Board etc.
1.	S. P. S. Choudhry	U. P. Government
2.	Dawar Hussain	"
3.	Rameshwar Dayal }	"
4.	B. N. Choudhury }	Bihar Private
5.	Dhanajai Pd. Asthana }	U. P. Government
6.	Mahatma Singh }	"
7.	Ahmed Hussain	"
8.	N. L. Sharma	"
9.	U. S. Srinivasatava	"
10.	C. H. W. Perera	Ceylon Government
11.	G. Brave }	U. P. Government
12.	P. P. Bisi }	Orissa "
13.	N. R. V. Rao	Hyderabad
14.	Sami Ahmad Khan	U. P. Government
15.	S. Mahmed Ali	Bettiah Raj
16.	S. A. Quasim	Jaipore State
17.	Shiva Shankar Mishra }	Bihar Private
18.	Sita Ram Singh }	"
19.	A. Ballabh	U. P. Government
20.	Zainuddin Zuberi	"
21.	Jai Bhagwan Sharma	"
22.	J. S. Michael	Mysore State
23.	A. N. Duivedi	U. P. Government
24.	Surendra Sinhe	Patna D. B.
25.	Rasik Behari Sinha	U. P. Government
26.	G. S. Negi	"

Patna (Bihar), }
28th April, 1948, }

S. K. SEN, B.Sc., M.R.C.V.S.,
Principal. •

MADRAS VETERINARY COLLEGE

The following candidates have passed the Final Diploma Examination of the Madras Veterinary College, held in March, 1948.

- | | |
|-------------------------------|-----------------------------|
| 1. Balagopal, P.N. | 15. Ramakrishnan, R. |
| 2. Balasubramanian, P. | 16. Ramachandra Reddi, K. |
| 3. Birendra Bahadur Singh. | 17. Ramaswamy, C. N. |
| 4. Ganesh Prasad Singh. | 18. Sankaran Nayar, K. |
| 5. Jayaraman, S. (Sivaraman) | 19. Sitaramamurthi, D. |
| 6. Jayaraman, S. (Sivasankar) | 20. Sivaraman, T. |
| 7. Krishnamurthi Rao, T. V. | 21. Sriramurthi, V. |
| 8. Krishnan, R. | 22. Subba Rao, N. |
| 9. Krishnan, T. | 23. Sundaraparipooranam, A. |
| 10. Lakshminarasimhan, A. | 24. Swaminathan, M. A. |
| 11. Padmanabha Rao, S. | 25. Venkataraman, R. |
| 12. Papayya, G. | 26. Venkataramanmurthi, K. |
| 13. Parasuraman, A. | 27. Viraraghavan, A. V. |
| 14. Rama Rao, T. | |

Madras
2-4-48 }

S. VAIDYANATHA MUDALIAR, G.M.V.C.
Principal.

Correspondence

Sir,

Wastage of straw

Regarding the letter on the above subject by Mr. R. L. Malhotra in Vol. XXIV, No. 4 of the *Indian Veterinary Journal*, there can be no diversity of opinion about the fact that the huge amount of straw—tons and tons of it—should not be wasted but should be utilised as cattle feed. But I do not agree with the correspondent in his suggestions to prevent the wastage.

It is very easy to suggest tiles and corrugated sheets for roofing, but, then, how is the farmer to get at these articles in these days of high cost and strict controls? What, however, should be the correct approach to the question is to educate the farmer on the economic use of the straw, and especially the Alkali-treated straw, with great advantage and benefit to his cattle. At present, the farmer does not know anything about the nutritive values of the treated straw and therefore it should be the duty of the Veterinary Surgeons to popularise it by practical demonstrations even in remote villages. Local Bodies and Panchayats should be induced to undertake this propaganda. When once the ryot is convinced of this method of feeding the straw, he will soon take to it with zeal and then there will be neither superfluous straw nor wastage of it. This is my suggestion to prevent wastage.

Parola, E. Khandesh Dt. }
15th March 1948. }

V. NARAIN NAVANGUL, G.B.V.C., P.G.,
Veterinary Assistant Surgeon.

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