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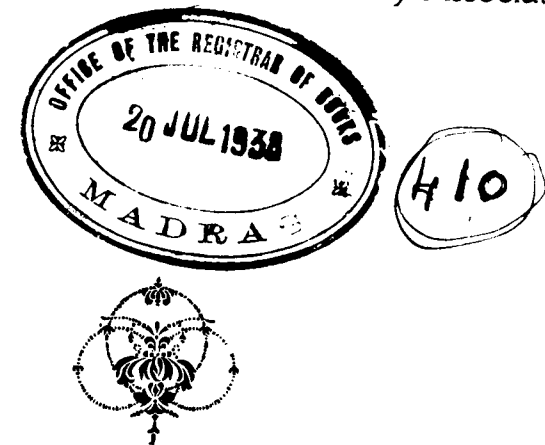
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The Indian Veterinary Journal

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



Editor .

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

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EDITOR:

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

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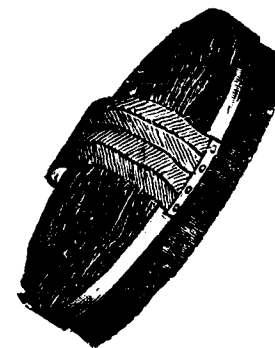
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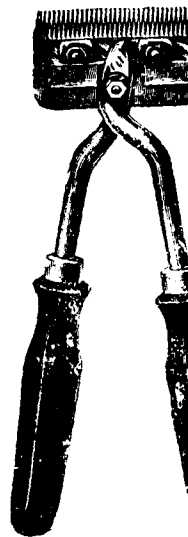
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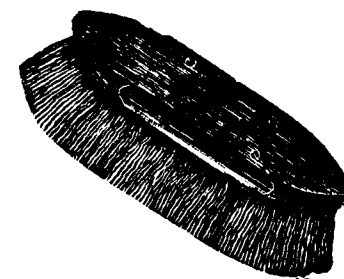
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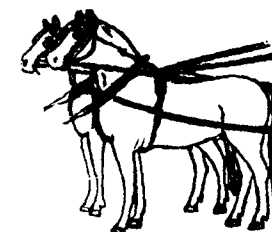
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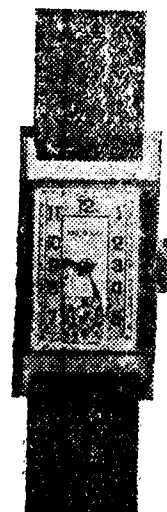
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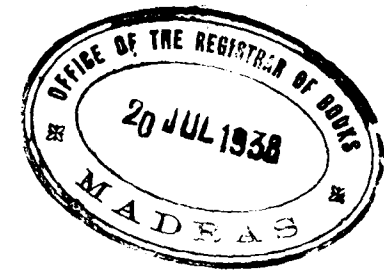
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THE
INDIAN VETERINARY JOURNAL.

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JULY 1938.

[No. 1.

General Articles.

**CROSS-BRED COWS, BUFFALOES AND SCINDI COWS
—A COMPARISON OF THEIR EFFICIENCY
AS DAIRY ANIMALS.**

By

N. S. SANKARANARAYANAN, G.M.V.C.,

Imperial Veterinary Serum Institute, Izatnagar.

Cross-bred cows, Buffaloes and Indian cows as Hariana, Scindi, Gir, Ongole, etc., are the three types of animals, recognised as the Milch Cattle in India, but nothing much in the form of investigation has been done to find out the comparative economic efficiency of these three different types. What little is known is only from statistical reports which is not based on results of actual tests. Cattle farming, however, cannot be reduced to a problem in statistics because of the wide variation in condition from place to place, yet actual measurement does provide a basis, particularly, in the cost of feeding and milk yields. It is essential also to know how much better one is than the other. The statement is often made that the cross-bred cow produces more milk and buffalo more fat without considering the low fat in the former and the quantity of milk in the latter and the cost of production in both. The real merit of the milch cattle is in the total yearly profits over the cost of maintaining her; so, high production of either milk or fat by an animal is important only when

accompanied by a good income, followed by production of better young stock. To discriminate quite accurately between the three types it is therefore necessary to study the different herds by conducting experiments under all possible normal conditions these animals are subjected to.

The present paper constitutes a comparison of the efficiency of cross-bred cows, buffaloes and Scindi cows as milch cattle. The data obtained are from a feeding experiment conducted by the author on the whole herd of animals consisting of the three types, at the Government Military Dairy Farm at Kirkee under instructions and guidance of Dr Warth, the late Physiological Chemist, and Col. Matson, the late Deputy Controller of Military Dairy Farms. The results obtained are of practical value in view of the fact that the experiment was subjected to the usual variations in conditions that arise during the ordinary working of a dairy farm on a commercial basis, and no special arrangement was made either for the selection of the animals under test or for the selection of fodders and concentrates.

The experiment was conducted for a period of nine months on the whole herd of cattle of the Kirkee farm consisting of cross-bred cows, buffaloes and Scindi cows. When an animal dried off it was taken away from the experiment. Similarly, when an animal calved it was placed under the test, the strength of the herd thus being not the same even for two fortnights as it generally happens in a farm. Table VII gives the details about the animals of the three herds. The experimental routine was in no way changed from the farm routine. Each fodder was given separately and the quantity consumed by each animal was determined. Each animal's concentrate ration was weighed out daily and fed. To facilitate computation of ration every animal was weighed for three successive days in a fortnight by turn and the average taken for maintenance calculation. Similarly milk yield of every animal was determined from three successive days' record in every fortnight; the butter fat was estimated at the same time. The ration including roughage was computed every fortnight according to the starch equivalent requirements of each individual

Cross-bred Cows, Buffaloes and Scindi Cows—as Dairy Animals 3

animal, as per standing orders issued to Military Dairy Farms then; according to that an animal weighing 1,000 lbs. got six pounds starch equivalent for maintenance, and 2.5 lbs. starch equivalent per 10 lbs. of milk production containing 3.5 per cent of butter fat and 1/60 of the ration for milk was added to every 0.1 per cent fat above 3.5 per cent.

Table I shows the constituents used and their proportion in the concentrate mixture at different periods. The roughages used were: hay, green maize, green jwar, guinea grass, green oats, lucerne, berseem and jwar silage—two or three at a time according to their availability in the Farm.

Table II gives the details of food consumed by each herd during the test together with its cost worked out according to Bangalore rate, and Table III gives the details of milk yields with their fat per cent.

The whole experimental period in which records were kept was 266 days but, as most of the animals were not in their respective herds throughout the full period, only actual days in milk for each animal are taken into account for calculation of the cost of milk production. Assuming all the animals were presented for all the 266 days, the sum total number of days for the average animal in each herd is:—

Buffalo	266	×	146	=	38,836	days;
Cross-bred cow	266	×	76	=	20,216	„
Scindi cow	266	×	54	=	14,364	„

of which the number of days in milk actual as counted for all the animals are 23,050, 12,645 and 10,720 respectively which are the milking periods of the average animals of the three herds and the rest are considered as dry days since only during dry days an animal was out of the experiment.

From the daily book the total quantity of fodders and concentrates fed during the period and their cost according to Bangalore rate for each herd are worked out and given in Table V; according to that it is found that to feed

		Rs	A.	P.
an average buffalo	for 23,050 days, food worth	22,402	10	9
„ cross-bred cow	„ 12,645 „ „	11,129	4	3
„ Scindi cow	„ 10,720 „ „	5,319	1	1

is required. The days during which the animals remained sick have not been taken into account for the calculation of milk production. Table IV gives the cost of milk and fat production. It may be added here that no cost other than that of feeding such as labour and other overhead charges has been included in the working out of the cost of production.

To have a fair comparison of the milk produced by the three herds, milk of higher fat content, that is, from buffaloes and Scindis, is reduced in the fat content to that of the cross-bred animals which contains the lowest fat percentage using Pearson's formula (page 311, *Modern Methods of Testing Milk*, by Van Slyke). The return in cash from each herd is worked out accordingly from the standardised milk and the extra butter fat; and the profits from the average animal of each herd is calculated and given also in Table V.

Discussion.

Figures in Tables IV and V show that an average buffalo requires Rs. 0-15-7 worth of food daily, costing Rs. 0-0-11-38 for the production of one pound of milk and 11 annas 9-5 pies for the production of one pound of butter fat over and above the standard milk and gives a daily profit of Rs. 1-2-3. The Scindi cow on the other hand has consumed only Rs. 0-7-0 worth of food costing Rs. 0-0-7-38 for the production of one pound of milk and Rs. 0-2-9 only for one pound of extra fat and gives a profit of Rs. 1-3-3 daily. It is apparent, therefore, from the above figures that milk and fat production is cheaper in the Scindi cow and the average Scindi cow gives one anna more per day to the dairyman. A cross-bred cow requires Rs. 0-14-0 for its feeding, *i.e.*, twice that of the Scindi cow, but by producing more milk than either of the two it brings down the cost of production of one pound of milk to 7-02 pies which is a little less than that of the Scindi cow and gives a profit of Rs. 1-12-10 over the cost of feeding, *i.e.*, Rs. 0-9-7,

Cross-bred Cows, Buffaloes and Scindi Cows—as Dairy Animals 5

more than the Scindi cow, and Rs. 0-10-3 more than the buffalo. So it is evident that the cross-bred beats both the buffalo and the Scindi in cheap production of milk, but the Scindi has the advantage over the buffalo. If the comparison is based on the cost of fat production only without consideration of the quantity of milk it is found that the cross-bred and the buffalo run close together with 11 as. 1½ ps. and 11 as. 1½ ps. respectively per pound of fat while an average Scindi cow requires only 10 as. 1½ ps. It is clear from Table IV that the major portion of the expenditure for feeding a buffalo is on concentrates, about 1½ times the cost of roughage. The cost of concentrate feed alone of a buffalo is found more than the cost of concentrate and roughage required for a Scindi cow. This extra cost of feeding in the buffalo is due to the extra requirements for maintenance, as the live weights of an average animal is about 1,200 lbs. This extra maintenance cost has no return from the dairy point of view, hence it is a clear loss to the dairyman as it could not be made good by the extra fat production, but in the Scindi cow the extra fat produced adds to the profits from milk production without addition to the cost of feeding. Another interesting point seen in Table V is that the profits derived from Scindi cows and cross-bred cows are more than three times the cost of feeding and in the buffalo it is only about twice. But if other items of expenditure for maintenance of the herds are taken into consideration, such as labour, dry feeding, Veterinary charges, the initial cost of building up the herd, etc., it will be seen that commercially the Scindi herd is a better proposition as such charges are proportionately less in this case.

Table VI gives the comparative dry periods. The dry periods are important from the dairy stand-point in order to see how far the different herds are capable of giving a continuous supply of milk to the dairyman and how long they require feeding and care without a return. Out of the 266 days of the test the average buffalo was in milk for 168 days, the average cross-bred cow 172 days and the average Scindi cow for 208 days. To have such a short lactation period the average buffalo should have an unnecessarily long dry period which is an unproductive period. Dry periods

calculated from three sets of figures more or less agree. The Scindi cow on the other hand has got a long lactation period which may be due to the long service periods, as the Scindi cows generally do not come to heat soon after calving, owing to the presence of suckling calves. Perhaps with the weaning of calves and regulated service a Scindi cow may come up to the level of the cross-bred where weaning, service and drying are systematically practised. The following is a comparative statement of their respective lactation periods:—

Herd.	Service period.	Lactation period.	Dry period.
Buffalo	Shortest	Shortest	Longest
Cross-bred cow	Little Longer	Longest	Little Longer
Scindi cow	Longest	Longest	Shortest

General.

Table VII shows the general behaviour of the three herds. It is seen that both the buffaloes and the cross-bred cows lost two animals each, by way of casualty which are to be discounted from their respective profits from the herd. Although casualty among animals is also one of the usual items of loss in a farm, it does not follow that it should happen only in the other two herds and not in the Scindi herd. The only conclusion which could be drawn from the figures is that casualty is more common in the other two herds. There is no doubt that the Scindi cows had a good number of days of sickness but, from the perusal of the experimental records, it is seen that most of the sickness was due to hoven, which shows that either they were overfed or their capacity for consumption was poor. It is now known also that the capacity for consumption in the Indian cows is poorer than in the cross-bred but this drawback it overcomes by its greater digesting capacity. So with a little reduction of its ration this usual sickness would have been prevented, thereby a small saving also could be effected in their cost of feeding.

Cross-bred Cows, Buffaloes and Scindi Cows—as Dairy Animals 7

The same Table further reveals that in the cross-bred herd there were four abortions, and one premature birth and in the other two herds only one each. Again of the 31 cross-bred cows served during the period, 14 cows required reservice and nine were served repeatedly but did not conceive. Of the 40 buffaloes served only nine required reservice and in the Scindi herd only one animal was reserved out of 18. Another interesting fact is that 12 buffaloes, five cross-bred cows and only one Scindi cow were discarded as useless either from continued illness or eccentricities. It is common among buffaloes that for no apparent reason the animal refuses its food and withholds its milk particularly. This is seen during the period of heat and no animal resents a change of food so much as a buffalo does. It is only from such eccentricities that the buffalo herd wasted such an enormous amount of food materials as is evident from Table VIII. This amount has no return except in the manurial value and daily out of the fifteen annas spent for feeding a buffalo, one anna has been a mere waste with no return. It is therefore clear that the average Scindi cow has beaten an average Murra buffalo on every point. Regarding the cross-bred cow it is a known fact that it is a better animal of dairy type, but the many disadvantages of adopting the cross-bred cow as the milch cattle in India is also well known and needs no further discussion.

Summary.

A comparison is made between the buffaloes, cross-bred cows and the Scindi cows as milch cattle from the data collected, from an experiment conducted in the Military Dairy Farm, Kirkee, and it was found:—

1. That the cross-bred cow gives a better profit over the cost of feeding, and the cost of milk production is cheapest in the cross-bred cows.

2. The average Scindi cow beats an average Murra buffalo in the cost of feeding, in the cost of production of both milk and fat and gives a better profit.

Acknowledgment.

It is my pleasant duty to express my thanks to Dr. Warth, the late Physiological Chemist, and Col. Matson, the late Deputy Controller of Military Dairy Farms, for the instructions and guidance given in carrying out this test. I am deeply indebted to Mr. Gill, the Officer-in-charge of the Kirkee Farm, and Mr. Har Swarup Narad, Supervisor in charge of the cattle, for facilities given during the course of this experiment.

Mention should also be made that Dr. Warth has kindly permitted me to publish this paper, for which I am indebted to him.

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Cross-bred Cows, Buffaloes and Scindi Cows—as Dairy Animals 9

TABLE I.
Concentrate Mixture Fed to All Animals during the Test with Percentage Contents of the Constituents and Minerals.

Item	Periods	Ground-nut cake	Wheat bran	Barley	Gram	Rice bran	Linseed cake	Cocoa-nut cake	Cotton seed	Til cake	Maize seed	Molasses	Minerals
1.	Up to 11-6-30	10	10	25	10	25	10	10	—	—	—	—	Bone meal 40%
2.	" 25-6-30	10	10	25	10	25	10	10	—	—	—	—	Salt 20%
3.	" 9-7-30	20	10	30	15	25	—	—	—	—	—	—	Lime 40%
4.	" 17-7-30	10	10	25	10	25	—	20	—	—	—	—	Pot. iodide 2 oz. of the above added to 100 lbs. of the concentrate.
5.	" 6-8-30	15	5	20	5	25	—	15	10	—	—	—	Salt 1 lb. to 100 lbs. of the mixture.
6.	" 15-10-30	20	5	25	15	10	—	—	10	—	—	—	
7.	" 29-10-30	25	10	30	15	10	—	—	10	—	—	—	
8.	" 12-11-30	25	10	30	15	15	—	—	10	—	—	—	
9.	" 3-12-30	20	10	30	15	15	—	—	5	—	—	—	
10.	" 31-12-30	25	10	30	15	15	—	—	5	—	—	—	
11.	" 7-1-31	25	5	25	10	10	—	—	6½	6½	20	—	
12.	" 21-1-31	13½	20	13½	6½	—	—	—	6½	6½	20	—	
13.	" 18-2-31	13½	20	13½	6½	—	—	—	—	—	—	—	

N. B.—The starch equivalent in the above mixtures was estimated to be 0.320 on an average in one pound of mixture.

TABLE II.
Comparative Cost of Feeding the Three Herds for Milk Production.

Fodders and concentrate.	Rate. Rs. A.P. per	Cross-bred cows.		Buffaloes.		Scindi cows.	
		Quantity fed in lbs.	Cost Rs. A.P.	Quantity fed in lbs.	Cost Rs. A.P.	Quantity fed in lbs.	Cost Rs. A.P.
Hay	1 8 0 100	42,463	636 15 0	125,726	1,885 14 3	36,890	553 5 7
Silage	0 12 0 "	105,626	793 2 0	368,866	2,766 5 0	37,034	277 14 0
Jwar and Maize	1 0 0 250	115,982	460 15 4	975,645	3,702 9 0	202,425	806 13 0
G. Grass	1 0 0 200	256,994	1,285 2 0	405	2 0 5	88,920	444 10 3
Green oats	0 12 0 100	49,130	368 15 7	—	—	6,675	50 1 0
Lucerne	1 0 0 80	66,089	826 5 2	2,120	26 14 0	—	—
Berseem	— —	18,857	235 12 0	75,890	948 11 0	3,955	49 7 0
Total cost for roughage			4,606 3 1		9,332 5 8		2,182 2 10
G. N. cake	2 12 0 100	32,833	822 11 8	68,882	1,894 6 0	16,028	429 13 0
Lin. cake	5 0 0 "	5,933	296 9 8	9,958	499 10 0	1,946	97 8 0
Wheat bran	3 8 0 "	18,204	639 14 10	33,727	1,181 11 0	7,384	257 15 6
Coco. cake	3 0 0 "	9,668	289 6 0	14,679	441 0 0	6,386	191 6 11
Gram	5 0 0 "	21,377	1,048 6 0	43,488	2,175 11 0	10,859	542 2 3
Molasses	6 4 0 "	3,168	198 0 0	5,382	336 2 0	2,087	130 7 0
Barley	4 8 0 "	44,883	2,020 6 6	87,905	3,953 11 0	22,835	1,016 7 0
Cotton seed	4 0 0 "	8,655	346 3 2	21,773	870 14 9	4,229	169 2 6
Til cake	5 0 0 150	1,590	53 0 0	3,126	104 3 2	194	6 7 6
Maize	6 0 0 100	6,666	399 15 4	15,270	916 3 2	1,085	65 1 7
Rice bran	1 4 0 "	28,547	356 8 0	48,134	601 9 0	16,368	204 12 0
Minerals	2 14 0 "	1,815	52 0 0	3,523	101 4 0	894	25 11 0
Total for concentrates		181,525	6,523 1 2	352,324	13,007 5 1	89,401	3,136 14 3
Total for all feeds			13,129 4 3		22,402 10 9		5,319 1 1

TABLE III.
Milk Yields of the Three Herds with Fat Percentage during the Test.

Periods.	Buffalo herd.		Cross-bred herd.		Scindi herd.	
	Milk in lbs.	Fat %	Milk in lbs.	Fat %	Milk in lbs.	Fat %
29th to 30th May	2,155.0	8.2	4,930.0	...	2,846.0	...
1st to 15th June	10,777.8	8.2	24,651.0	4.2	14,234.0	5.1
16th to 30th "	10,287.5	7.4	23,870.0	4.3	14,408.0	4.9
1st to 15th July	13,478.0	7.4	19,935.0	4.5	13,425.0	5.1
16th to 31st "	18,832.0	6.8	19,262.0	5.1	12,432.0	...
1st to 15th August	19,876.0	7.1	16,506.0	4.8	10,170.0	5.5
16th to 31st "	22,270.0	7.5	16,352.0	4.6	9,776.0	5.9
1st to 15th September	21,258.5	7.7	14,313.0	5.0	9,567	5.4
16th to 30th "	23,790.0	7.5	14,529.0	4.6	8,664.0	5.6
1st to 15th October	24,693.0	7.7	12,801.0	4.5	7,593.0	5.6
16th to 31st "	27,974.2	8.7	13,601.0	4.5	7,629.0	5.2
1st to 15th November	23,600.0	8.7	14,706.0	4.7	6,738.0	5.5
16th to 30th "	25,203.5	7.9	15,751.0	4.6	5,576.0	5.9
1st to 15th December	24,784.5	7.5	16,395.0	4.9	4,211.0	6.7
16th to 31st "	26,085.0	7.8	16,418.0	4.7	3,978.0	6.4
1st to 15th January	30,366.0	8.1	16,469.0	4.9	3,178.0	6.2
16th to 31st "	27,809.8	6.8	19,301.0	4.9	2,286.0	6.6
1st to 18th February	27,264.2	8.7	24,637.0	4.4	1,718.0	6.4
Total	380,406.0	7.74	304,427.0	4.66	138,439.0	5.75

TABLE VIII.

Comparative Wastage (Food Left off) of Cattle Food in the Three Herds of Cattle during the Experiment.

	Cross-bred herd.		Scindi herd.		Buffalo herd.	
	Quantity in lbs.	Cost. Rs. A. P.	Quantity in lbs.	Cost. Rs. A. P.	Quantity in lbs.	Cost. Rs. A. P.
Hay	5,434	81 8 0	7,787	116 13 0	26,954	404 4 0
Silage	14,669	110 1 0	4,994	37 7 0	42,199	316 8 0
Green jwar	13,901	55 5 0	26,492	105 15 0	99,025	396 2 0
Gunnea grass	16,512	82 9 0	8,866	44 5 0	35	0 3 0
Green oats	3,968	35 13 0	288	2 2 0	...	...
Lucerne	2,864	37 3 0	...	...	62	0 6 0
Berseem	1,722	21 9 0	275	3 7 0	4,367	54 9 0
Total concentrate dry basis	2,533	83 7 4	1,125	39 15 0	10,998	366 9 7
Total for the herd		507 7 4		349 15 0		1,538 9 7
Av. for one animal		0 0 7		0 6 4		0 1 0·8

N. B.—1. Lucerne was fed only to cross-bred cows and for one week to buffaloes.
2. Green oats to cross-bred cows and for one week to the Scindi cows.

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LIVE-STOCK IMPROVEMENT IN RELATION TO RURAL RECONSTRUCTION IN MYSORE.*

BY

C. NANJUNDIAH, G.M.V.C.,

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The improvement of live-stock must necessarily occupy a prominent place in any scheme of rural reconstruction, because it is undoubtedly an industry of overwhelming importance in an agricultural country like India.

Dr. N. C. Wright, Director of the Hannah Dairy Research Institute, in his very learned survey on Indian Dairying has estimated the value of all the animal products of India at nearly Rs. 1,000 crores per year and that of dairy products alone at Rs. 300 crores annually, which is almost equal to the value of our total rice production in India. Unfortunately, an industry of such paramount importance is sadly neglected and no scientific planning on an extensive scale has ever been attempted in this country for its improvement. No doubt, there are various agencies mostly operated by the Governments, which are doing their best for the improvement of live-stock; but their efforts have so far touched only the fringe of the problem and the ryot is still to depend largely on his own devices, which are anything but satisfactory, for the improvement and maintenance of his stock. The net result is that, instead of any real improvement, there has been a gradual and sad deterioration of stock, so much so, that time appears to have come when the problem has got to be tackled with much more seriousness than hitherto.

Fortunately, we have at present a Viceroy who, by his wise precept and excellent example, has roused our agricultural consciousness. His very noble gesture in presenting stud-bulls immediately he assumed office is already bearing fruit. The recent Cattle Conference at Simla over which His Excellency presided and the repeated stress he has been laying on the importance of our cattle industry bear ample testimony to the

* Paper read at the Ninth Annual Conference of the Mysore Veterinary Medical Association held at Bangalore on the 19th December 1937.

stimulation he has given to schemes of Rural Reconstruction all over the country.

The Government of His Highness the Maharajah of Mysore have always displayed keen interest in the welfare of the agriculturist and every attempt is made by them to improve the lot of the ryots in the State. The various irrigation schemes, that have been recently taken up and now in operation, the selection of model villages in which the ryot is shown how best he could improve his condition and that of his surroundings by various items of rural reconstruction—these and several other endeavours that are being made by the Government, show that our State is fully alive to the fact that the agriculture is the back-bone of our economy and that, more than anything else, it is our villages that have got to be improved first, in order that the State may become more progressive. But we have still to realise the significance of His Excellency's statement that "The cow and the working bullock carry on their patient backs the whole structure of Indian agriculture".

As veterinarians, our activities have so far been concentrated on the control of live-stock epidemics and treatment of sick animals; but we have to take a larger view of our responsibilities and strive for the improvement of our live-stock. It goes without saying that, as professional men, it is we who are best fitted to take the lead in the matter and it is also a responsibility we are bound to discharge with the greatest satisfaction. It is needless for me to recall the steadfastness with which the great authorities on Animal Husbandry in India, Col. Sir Arthur Olver, as well as Dr. Wright, who gave us their well-considered suggestions in the matter; as a matter of fact all those, who have an unbiassed opinion on the problem, are holding to this view in all their utterances. Of course, in working out any programme of live-stock improvement in India, we have to depend on the unstinting co-operation of various Departments of Government, as also on public sympathy and support. Being confident of this support, I venture to place before you a few of my suggestions for the solution of this important problem facing us to-day.

Before we could think of remedies it is only proper that we must be correctly appraised of the existing situation for which a properly conducted live-stock survey is very necessary. My first suggestion would be the appointment of a special officer for this purpose in each district of the State, as a full-time man to collect and analyse the statistics of each village and place them before the Government as well as the public in such a way that the situation may be rendered clear to them. The survey should include the following aspects:—

- I. A comprehensive live-stock census giving :
 - (a) The number of good cows fit for breeding purposes.
 - (b) Number of cows of good milking strain. .
 - (c) Number of cattle fit for agricultural purposes.
 - (d) Number of animals which are deteriorated and unfit for any work.
 - (e) Number of buffaloes of good milk strain.
 - (f) The kind of stud-bulls and buffalo-bulls which are now used in the village and the condition of their progeny.
- II. The area of "Gomal" lands and their condition and whether the fodder grown in the locality is sufficient for feeding the live-stock of the village.
- III. The area under agricultural operations; whether the existing live-stock is sufficient; whether there is adequate supply of types of cattle suited to agricultural requirements of the place.
- IV. The number of animals purchased and sold by the village; whether the village has to depend upon outside sources for its requirement of cattle.
- V. The indebtedness of the ryots and its effect on their capacity to go in for good animals and, conversely, the extent to which the ryots are keen on going in for good stock and its effects on their general indebtedness.

- VI. Facilities available for the improvement of live-stock by way of good pasture lands, proximity to forest areas, climatic conditions, etc.
- VII. Facilities available for the marketing of animal products.
- VIII. Detailed information regarding live-stock other than cattle.

A survey as suggested above would give us a correct idea of the present condition of our live-stock which, however, we are already aware of in a broad sense. The main defects, as we all know, are the limited number of good cattle in any of the villages and the preponderance of animals which are stunted in growth and are unfit for either a copious supply of milk or for any efficient agricultural operation. It is the same as regards any other live-stock like sheep, goats and poultry, etc., whose food and productive value is exceedingly low. This disparity in number between the live-stock of good and bad quality in the villages has contributed to the general deterioration of live-stock throughout the State. The limited supply of fodder available in each village is wasted on useless animals, the good ones being deprived of their legitimate share. The fodder consumed by animals of poor quality is disproportionate to their usefulness, whereas the better and more useful live-stock have hardly enough for their needs and are gradually themselves reduced to the level of inferior cattle. Their progeny turn out to be worthless animals, are poor milk yielders, and are unfit for strenuous agricultural operations. Another factor, which has contributed to the degeneration of our stock, is the very insanitary condition in which they are housed and reared especially in the Malnad tracts. The dirt and neglect in which most of our cattle live their existence lead to heavy infestation of ticks and other skin parasites. Being badly bred, badly fed, badly housed and badly looked after, it is no wonder that our cattle are hardly able to resist diseases, so much so that, when there is an epizootic, the percentage of mortality is much higher than it need be.

In this connection I would like to touch upon an erroneous idea that often prevails among the townspeople that the milk coming

from the villages represents the surplus of the village, after the villagers have had their fill. I have made personal investigation in the matter and you will be probably surprised to hear that it is only a negligible fraction of the milk and milk-products of each village that is consumed in the village itself. It is a luxury for the villager to have the milk and the milk-products for himself though he may deal with them everyday. We can say that on the average not even 1/16th of a seer of milk is consumed per head per day in several villages of the Mysore State and that efforts should first be directed to induce the villagers to consume more and more of these.

There are, therefore, various aspects of the problem we have to consider and I put the following suggestions before you which appear to me to be the main lines towards which our efforts should be directed. They may be considered under the following four headings:

- I. Selection and improvement of breed.
- II. Fodder
- III. Finance
- IV. Propaganda.

I. *Selection and Improvement of Breed.*—This could be accomplished by:—

- (a) Grouping of villages as per cattle census and distribution of good breeding bulls.
- (b) Selection of good animals for breeding purposes.
- (c) Compulsory castration of all scrub bulls.
- (d) Elimination of deteriorated animals in the area and the formation of "Pinjarapoles" for looking after them.
- (e) Introduction of improved poultry and breeding rams in each of the villages.
- (f) Maintaining the complete records of all breeding operations.

II. *Fodder.*—Preservation of "Gomal" lands in good pasture condition, expansion of lands under pasture, growing of fodder crops and providing sufficient fodder against

seasonal scarcity as per "Silo" system. The ways in which greater facilities may be given to the ryots for grazing cattle in the State forest may be explored.

III. *Finance*.—The following are my proposals for providing necessary funds for improvement of live-stock:—

- (a) Formation of **Co-operative Societies** among the villagers, (i) for purchasing cattle and other live-stock, and (ii) for marketing live-stock and its biproducts. The successful working of the co-operative creameries in Ireland and Denmark show how the principles of co-operation, if properly worked, contribute to the benefit and prosperity of the ryots.
- (b) Grant of **Takkavi** loans by the Government on a generous scale for the purchase of all varieties of improved live-stock.
- (c) Reserving a certain percentage of funds of each village Panchayat for the improvement of the live-stock in the village.
- (d) To move the Government to grant the major portion of their revenues from the cattle-fairs in the State for the improvement of cattle and other live-stock.
- (e) To levy a tax on live-stock purchased from outsiders and utilize this amount for their improvement.
- (f) Introducing Cattle Insurance system.

IV. *Propaganda*.—To secure the sympathy and support—moral as well as material—of the general public in the cause of live-stock improvement, by organising an active campaign of educating the villagers through popular bulletins, demonstration lectures, illustrated as far as possible with suitable educative lantern slides, cinematographic films and, through these means awaken in them, their primary responsibilities to live-stock which forms the very foundation of their prosperity.

RABIES PROPHYLAXIS IN DOGS WITH SPECIAL REFERENCE TO THE DEVELOPMENT OF THE SINGLE INJECTION METHOD IN MYSORE.*

By

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The appalling increase in the number of cases of Rabies among animals and the consequent increase in the number of persons exposed to infection during the last few years, has brought this question to the foreground and has rendered the problem of finding a satisfactory means of controlling the disease of more serious importance to both public health officials and those whose duty it is to combat transmissible diseases of animals. The burden of carrying out control measures must rest on the shoulders of both and vividly illustrates the absolute and urgent necessity for close co-operation of the medical and veterinary professions in this country.

Rabies is one of the few diseases that is invariably fatal and once symptoms develop there is no hope of recovery. Stamping out the disease completely should therefore be our ultimate goal. The prophylactic measures to be adopted with respect to rabies proceed along two lines. On the one hand it is desirable to reduce to a minimum the possibility of infection for both human and animal subjects and, on the other hand, once an infection has been sustained by a human being or an animal, to prevent the disease from becoming manifested. Success can be achieved in both these directions.

As the dog is the principal source of propagation of rabies, methods for the control of the disease must logically be directed to the control and eradication of the scourge in dogs. The methods, whereby the danger of infection can be diminished, have been outlined in all civilized countries by means of State and other

* Paper read at the Ninth Annual Conference of the Mysore Veterinary Medical Association held at Bangalore on the 19th December 1937.

regulations on the subject and consist principally of the extermination of stray dogs and the regular licensing and muzzling of all others, together with the enforcement of quarantine measures. These, in recent years, have been augmented by the prophylactic vaccination of dogs. In India direct extermination of dogs by a policy of slaughter and segregation cannot be universally applied for many obvious reasons. The only course open to us, therefore, is through an efficient system of preventive vaccination.

At present it has been customary for the average dog owner in this country to resort to anti-rabic vaccination mostly as a curative procedure, as a means of aborting the infection which may already have been contracted. Curative vaccinations are undertaken subject to the provision that the dogs so treated be held under quarantine for a period of six months after this. Regarding the methods employed for curative vaccinations Pasteur's original anti-rabic vaccines, which stand as one of the enduring monuments to that great man, have considerably reduced the mortality from rabies and is without doubt one of the greatest blessings bestowed on mankind by medical science. It cannot, however, be considered the solution of the problem, for, notwithstanding its undoubted success, the method is not infallible, is expensive, and requires frequent injections extended over a considerable length of time, causing great mental anxiety to the owner until time alone has assured the success of the treatment. The success of treatment, in its turn, depends on its employment as soon after exposure to infection as possible, so that an immunity can be produced to counteract the development of the disease which usually takes several days.

During recent years various methods have been employed to this end, both as regards the nature of virus used and the duration of its employment. The vaccine may consist of dead or living virus, cord or brain material; fixed virus of the rabbit or of other animals; it may be glycerinated, carbolised, formolised, cholorform-treated or etherised. A consideration of all these modes of vaccination is not possible here and it suffices to say that they are all in greater or less degree variations of the original Pasteurean method.

In most of the civilized countries at the present day rabies has been controlled through measures, chief of which is the preventive vaccination of dogs. State regulations in these countries enforce all dogs to be protected against rabies every year before the yearly renewal of ownership licences. Ownerless dogs rarely exist. This accounts for the exceedingly low incidence of rabies among human beings in these countries. In India, on the other hand, a system of preventive vaccination has not been adopted as a general measure of controlling rabies so far. But with the rapidly increasing education of the Indian public to the public health aspect of the disease here, it appears opportune to institute measures, with a view to reducing the incidence of rabies among human beings, by regular prophylactic vaccination of the normal and by far the only carrier of infection—the dog. It may be expected that any such method would tend to check the disease in its natural host from being transmitted to the adventitious hosts, such as man and his domestic animals. At the same time it is necessary that even for the application on a limited scale the vaccine must be innoxious and easily administered. For these reasons any method based on Pasteur's original formula and its numerous modifications, whose shortcomings have already been enumerated above, is impracticable and must necessarily give room to a simpler method. A method to be used on dog should, if possible, be confined to only one injection. It should also be cheap, be absolutely harmless, avoiding all possibility of inoculatory paralysis, and should confer an active immunity against the natural infection over an appreciably long duration.

The first experimental and practical work done towards developing a single injection method of preventive vaccination of dogs against rabies was undertaken in Japan by Umeno and Doi and was reported by the Minister of Agriculture in Japan during 1925 and 1930. The reports covered the vaccination of 1,685,265 dogs all over Japan (*vide* Table I) from 1918 to 1930, of which only 291 or 0.017 per cent developed rabies, while out of the non-vaccinated lot 16,522 cases of rabies were recorded. Table II gives the result of anti-rabic vaccinations of dogs in the Department of Tokyo

alone from 1919 to 1926. During this period a total of 205,310 dogs were vaccinated; of these 48 or 0.0233 per cent developed rabies within two weeks of inoculation and 112 or 0.05 per cent within one year. Among non-vaccinated dogs 4,275 cases of rabies were encountered during this period. As could be seen from Tables I and II there is a great difference in the incidence of rabies between the vaccinated and non-vaccinated dogs, decidedly in favour of the vaccinated group. In Tokyo from 1921 to 1925 118,151 registered dogs were vaccinated; of these 105 or 0.08 per cent died of rabies, whereas of the 21,968 non-vaccinated registered dogs, 529 or 2.4 per cent succumbed to the disease (see Table III), a data better calculated to determine the efficiency of preventive vaccination. Since the publication of this report vaccinations have been made compulsory in Japan and has resulted in almost eliminating rabies from that country. Eversince the epoch-making results of the Japanese workers in the domain of anti-rabic prophylaxis were first published by the Ministry of Agriculture and Forestry in Japan, a galaxy of rabiologists all over Europe, notably in U. S. A. (Eichhorn and Lyon, Schoening, Reichel and Schneider, Schling man), France (Valle), Portugal (Marques dos Santos), Hungary (Aujeszky), Italy (Finzi), etc., have contributed to the literature certifying to the efficiency of the single injection method of preventive vaccination with an exceedingly small number of reports of failure.

Following these reports, the Public Health Committee of the League of Nations in 1927 passed a resolution recommending to the sanitary authorities all over the world that the universal vaccination of dogs by the single injection method may be encouraged. The International Rabies Conference held at Paris in the same year also recommended that "Dogs be given prophylactic vaccination against rabies; such vaccination, as far as possible, should consist of a single inoculation of a dead killed virus (still capable of conferring immunity) or of a fixed virus, modified or not, which is not pathogenic to the dogs when inoculated subcutaneously or intramuscularly." The Eleventh International Veterinary Congress held in London (1930) observed that the single injection method of preventive vaccination had furnished

abundant proof of its harmlessness and efficiency and recommended its universal application. The chief of the United States Bureau of Animal Industry, Dr. John R. Mohler, after a careful study of the subject, stated that "If all the dogs in the United States could be protected with this method of vaccination annually, rabies would cease to be a public health problem in this country". In fact every scientific body in the world that has made a study of the subject eversince has adopted a similar resolution. It is surprising, however, that in India no such move seems to have been made till recently, when the Imperial Council of Agricultural Research did well in financing a scheme for the study of this problem at Muktesar and the investigations in this direction are expected to be taken up soon. I started studying this problem a little more than a year ago, the object of such a study being two-fold:—

(1) To ascertain the relative merits of all the available single injection anti-rabic vaccines with a view to selecting one which, under the conditions prevailing in the State, could be used with impunity as the most reliable method of preventive vaccination against rabies in dogs.

(2) To undertake a comparative study of some of the curative vaccines with a view to choosing one which could be employed for post-infection prophylaxis in dogs and other domestic animals.

For purposes of preventive vaccinations the following vaccines were considered:—

- (a) Chloroform vaccine first prepared by Kelser in U. S. A.
- (b) Etherised vaccine developed by Remlinger and Baily and Alivisatos in the French Mediterranean Colonies.
- (c) Dextrinised phenolised vaccine employed by Plantureux.
- (d) Formolised vaccine of Plantureux and Puntoni.
- (e) Glycerinated phenolised vaccine elaborated by Umeno and Dei in Japan.
- (f) Phenol-glycerinated vaccine modified by Kondo in Japan.

Of these the first four lack stability, are more expensive and require the administration of at least two injections to set up the desired immunity against an artificial street virus infection of rabies. The two Japanese vaccines have, however, received the greatest attention and, in a single dose of 5 to 6 c.c. administered subcutaneously, are credited with conferring a solid immunity against the disease for a period of about one year in average-sized dogs (weighing from 12 to 15 kg.). Their efficiency has been proved by scientific investigations and by actual field results in communities where rabies has been known to exist to such an extent as to constitute a serious public health problem. Unlike the other products, the Japanese vaccines are said to be stable for at least two months, a fact which appears to make them most suitable for Indian conditions.

A study of the relative merits of these two vaccines was therefore taken up by me and the investigation is now in progress. Although the experimental evidence for proclaiming a final verdict on this method of anti-rabic prophylaxis in India is not yet mature, the results achieved so far appear to be very encouraging and seem to augur a great future for the single injection method of preventive vaccination against this dreadful ravage humanity has known since the time of Aristotle. The results of the present investigation will form the subject of a separate monograph to be published shortly as soon as the experiments are concluded.

On the curative side, two vaccines (i) the Nigerian modification of Sir Semple's vaccine (Kasauli method), (ii) the Italian modification (Finzi) of the Japanese vaccine are also under investigation. The treatment consists of four to seven subcutaneous injections in the former, depending on the nearness of bite to the brain of the animal and of six injections extended over three days (given twice daily) in that of the latter, subject to the condition that the dogs so treated are kept under observation for six months. Results of this study have also been encouraging.

Conclusions.

1. The control of rabies in India should include an efficient system of both preventive and curative vaccinations of the dog,

Rabies Prophylaxis in Dogs by Single Injection in Mysore 27

in addition to such of the sanitary measures as could be enforced without any sentimental prejudice or religious controversy.

2. The established methods of vaccination of dogs based on Pasteur's original formula and its numerous modifications are impracticable for several reasons and any investigation upon the relative merit of a particular vaccine should be confined to those that can be given at one injection.

3. The exceedingly encouraging results obtained with the Japanese vaccines in Mysore warrant a further experimental study of these methods, which should be undertaken before these products are used for preventive vaccination in the field.

TABLE I.

*Results of Preventive Vaccination against Rabies
in Japan from 1918 to 1930.*

Year.	Number of dogs vaccinated.	Number of vaccinated dogs developing rabies.	Percentage of vaccinated dogs developing rabies.	Number of non-vaccinated dogs died of rabies.
1918	10,951	6	0.061	1,041
1919	41,779	16	0.066	860
1920	26,103	4	0.036	500
1921	53,744	18	0.438	892
1922	58,141	33	0.042	983
1923	116,050	31	0.267	2,613
1924	194,177	44	0.023	3,172
1925	254,067	45	0.018	3,075
1926	234,680	55	0.234	1,770
1927	209,032	20	0.010	966
1928	225,636	13	0.006	421
1929	145,953	2	0.001	165
1930	114,892	4	0.003	64
Total	1,685,265	291	0.017	16,522

TABLE II.
*Results of Anti-Rabic Vaccination of Dogs in the
Department of Tokyo, Japan.*

Year.	Number of dogs inoculated.	Number of dogs developing rabies				Number of non-inoculated dogs which developed rabies.	Number of persons exposed to rabies.
		Within two weeks after inoculation.		Deaths within one year.			
		Number.	Per cent.	Number.	Per cent.		
1916	...	...	...	...	...	428	...
1917	...	...	...	...	...	456	...
1918	...	...	...	...	...	511	2,018
1919	16,165	13	0.0866	1	0.0061	449	2,094
1920	15,928	...	...	3	0.0195	262	2,356
1921	22,385	6	0.0223	...	...	358	2,286
1922	19,943	4	0.0200	14	0.0702	192	2,909
1923	19,959	...	...	7	0.0351	119	2,867
1924	24,150	7	0.0289	29	0.1201	690	2,453
1925	41,877	13	0.0310	32	0.0764	456	2,953
1926	44,903	5	0.0111	26	0.0557	354	4,510
Total	205,310	48	0.0233	112	0.0546	4,275	29,940

TABLE III.
*Incidence of Rabies in Vaccinated and Non-Vaccinated
Registered Dogs in Tokyo.*

Non-inoculated registered dogs.				Inoculated registered dogs.		
Year.	Number.	Rabies.	Mortality.	Number.	Rabies.	Mortality.
1921	3,886	179	4.61	22,181	6	0.02
1922	1,188	92	7.74	24,282	19	0.08
1923	6,780	42	0.62	19,959	7	0.03
1924	2,279	166	7.28	24,150	43	0.18
1925	7,835	50	6.38	27,579	30	0.11
Total	21,968	529	2.40	118,151	105	0.08

RINDERPEST—PREPARATION OF SERUM.

BY

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*Retired Deputy Director, Imperial Veterinary Serum Institute, Izatnagar,
Loutulim, Goa.*

It was Koch who, during his experiments in South Africa to ascertain the best means of stamping out rinderpest outbreaks, first made the observation that, when the defibrinated blood of an animal that recovered from rinderpest was inoculated into a healthy one, it protected the latter animal sufficiently against the disease and he carried out several inoculations which gave fairly satisfactory results. Semner working on the same disease also observed that serum obtained from an animal that recovered from rinderpest afforded protection to healthy animals. Again Kolle and Turner were able to immunise healthy cattle by the simultaneous inoculation of serum and virulent blood and later discovered that, when animals that recovered from the simultaneous inoculations were injected with virulent blood alone, they would not contract the disease and could produce serum which gave protection to the healthy animals. Thus by these experiments the essential principle of manufacture of anti-rinderpest serum was established, viz., that an animal must be first immune as a result of recovery either from a natural attack of rinderpest or from artificial infection by the simultaneous method, before it can produce serum which can afford protection against the disease to animals which are non-immune. The procedure of preparing the serum, however, varies in different countries where such institutes exist according to the conditions and circumstances prevailing in them.

Before describing the various methods of preparing the anti-rinderpest serum it would be advisable to consider the several points necessary in the serum makers for preparation on a large scale of serum of high potency economically. The points are : susceptibility, the weight and condition of the animals, their availability in large numbers, age and their serum producing capacity.

Animals of high susceptibility or low resistance are preferable to those of higher resistance as they are likely to react more severely to the rinderpest infection and form within their system the immune bodies in larger quantity. When serum was first manufactured at Muktesar many years ago and both the cattle of the Himalayan regions and those of the plains were employed for this purpose, the serum produced by the susceptible hill cattle invariably turned out to be more potent than the one produced by the less susceptible cattle of the plains. Experiments carried out in certain parts of Africa, such as Kenya Colony, Nigeria, etc., have also borne out the fact that the susceptible animals produce a more potent serum than those having higher resistance. However there are exceptions where animals of higher resistance have produced serum of equal potency if not higher than the serum produced by animals of low resistance. This has been proved on several occasions at the Muktesar Institute where the highly susceptible hill cattle and the less susceptible plains buffaloes have been employed as serum makers. The serum tests carried out comparatively and separately have revealed that the serum of the buffaloes is as potent as, and sometimes even more potent than, the one produced by the hill cattle.

The weight and condition of the animals to be employed as serum makers are also of importance, as the quantity of blood yielded is in proportion to their body weight and physical condition. It has been observed that it is economical to have one weighty serum maker in fit condition in preference to a couple of serum makers of less weights and fair condition. Of course a serum institute will have to judge whether the menial staff employed by them is able to handle very heavy animals efficiently before selecting them. At the Muketsar and Izatnagar Institutes, the routine procedure is to purchase buffaloes whose weights range from 800 to 1,000 lbs. each, the menial staff there being composed mainly of the hill people who are small in stature and physically not very strong.

When serum has to be manufactured in large quantities, obviously the supply of animals will have to be constant. There-

fore it is essential that the sources of supply, such as the cattle fairs, etc., should not be too distant from the serum institute, so that the total cost of the animals after including the journey expenses to the Institute is not prohibitive. These are important factors worth consideration particularly when selecting a site for a serum institute.

As regards the age of the serum makers this depends upon the period of life when they are considered to be very susceptible. At the Muktesar and Izatnagar Institutes rather young and old animals have been found to be unsuitable and the ages recommended when purchasing buffaloes for serum producing are three to seven years.

When the average yield of serum from the blood of a serum maker attains a high percentage, such an animal is understood to have a high serum-producing capacity. The method of extraction of serum from blood varies in the different institutes. An institute which is well equipped with centrifuges, electric installation, etc., may find it convenient and economical to extract the serum by the centrifugalisation of blood; another which is not so equipped may find it convenient and economical to extract the serum by the clotting or the oxalate method. Again it has been observed that the Himalayan cattle and the plains cattle are not very useful as serum producers as the average percentage yield of serum is not high while certain animals such as the plains buffaloes yield a rather high percentage of serum. Another reason why buffaloes are preferred as serum producers at the Izatnagar Institute is that serum can be prepared easily by the oxalate method, as sedimentation of the corpuscles is quicker than in the case of hill or plains cattle.

There are two methods of preparing the anti-rinderpest serum: one is the 'hyperimmunisation' method and the other is what is known as the 'immune' method. In their early experiments in Africa Kolle and Turner injected virulent blood in quantities of 100 c.c. into animals which had recovered from the disease. This was followed by injections at certain intervals of larger quantities of blood, the last injection being 1000 c.c. After this the animal was bled on three occasions at intervals of about ten days and then

again injected with 2000 c.c. of virulent blood and again bled as before. The hyperimmunising injections were continued in increasing doses and bleedings done till the final dose of 5000 c.c. was reached. This method was adopted to a certain extent by Dr. Lingard at Muktesar, when he first prepared the anti-rinderpest serum from the hill cattle which were then considered to be the most suitable as serum producers. The procedure was to immunise the hill cattle by the serum-simultaneous method and after recovery about the end of the third week to inject them with one to two litres of defibrinated virulent blood subcutaneously. A fortnight later after the effects of the injection passed off, they received another injection of virulent blood alone the quantity being from two to three litres. After three weeks the same animals were bled at intervals of two to three days up to three times. The plains bulls of the Bareilly District employed as serum makers were similarly treated but were bled up to 12 times at intervals of one week. Holmes later on introduced the rapid method. After immunisation they received a massive injection of defibrinated virulent blood, the dose depending on the size and weight of the animals and were bled a few times. After a short interval they were injected again with a slightly higher dose of the virulent blood and bled again. The rate for the first massive injection of virulent blood was usually 8 c.c. per lb. body weight and that for the last injection was 10 c.c. per lb. body weight. The rates for bleeding were 6 to 10 c.c. per lb. body weight.

As the demands for anti-rinderpest serum increased and the hyperimmunisation method necessitated the bleeding to death of a large number of hill cattle employed as virus producers in order to provide the defibrinated blood and scarcity of the hill bulls was being felt, Holmes introduced a few changes in the method of serum preparation by which he hoped that, with the same number of hill bulls employed as virus producers, a larger quantity of anti-rinderpest serum would be prepared. The virus producers were bled twice to provide the blood, the first time at the rate of 4 c.c. per lb. body weight and the following day bled to death. The other change was that a serum maker after being immunised

was bled about the 21st day after the initial inoculation and then hyperimmunised as described above. In spite of these improvements there was difficulty in meeting the increasing demands for serum from the provinces of India and other countries. At this stage Holmes introduced slight alteration in the technique which proved economical and easy of execution. In order to provide the defibrinated blood a large number of glass vessels were required to receive and defibrinate the blood and a large staff of trained men to roll the bottles, etc. The quantity of defibrinated blood obtained from each virus producer just sufficed for the hyperimmunisation of two to three serum makers. The change introduced was to bleed the virus producers into vessels containing Pot. Citras solution and to inject this virulent mixture (equal parts of blood and solution) into the serum makers, at the same rate as the defibrinated blood. Apart from the considerable saving in time, labour and material the quantity of virulent material for the hyperimmunisation was doubled without an increase in the number of virus producers. The serum makers were utilised until they were unfit for serum production and they naturally received several massive injections. As it was observed that many old serum makers developed abscesses in consequence of non-absorption of the material injected, the rate of injection was reduced by about 50 per cent, and further economy resulted without deterioration in the potency of the anti-rinderpest serum. The serum makers received the reinforcing injections until found to be unsuitable for further serum production and they were bled once after the immunisation and before the first hyperimmunising injection and twice after each massive injection at an interval of two to three days.

The supply of hill bulls for virus producing and other experiments at the Muktesar Institute was a serious problem and it was feared that, with the increasing output of serum, the neighbouring districts, which were the sources of supply, would be unable to meet the demands for the hill bulls. The Government of India, therefore, proposed to have another Serum Institute at Abbotabad in the Himalayan range. As Holmes considered that this Institute would also meet the same difficulty of bull supply after some years

he conceived the plan of preparing serum from the plains buffaloes and employing hill bulls only as virus producers. He carried out a series of experiments with this object and discovered that a potent serum could be produced from the buffalo serum makers not only with hill bull virus as the antigen, but also by employing buffalo virus both as immunising and hyperimmunising agent. In consequence of this discovery, large numbers of plains buffaloes were being utilised at Muktesar and later at Izatnagar for serum production, and the output of serum increased considerably. The procedure for serum preparation at this stage was to immunise buffaloes by the serum-simultaneous method using hill bull virus and bleed them about the 19th to 21st day at 8 c.c. per lb. body weight and hyperimmunise them and bleed them twice on the 8th and 10th day at 6 and 8 c.c. per lb. respectively. The serum makers received several injections and were bled twice after each immunisation and were finally discontinued, when no longer fit for further injections.

Attempts were made in a series of experiments to economise the serum production. Shilston tried three bleedings after each hyperimmunisation on the 8th, 12th and 16th day at 6 c.c. per lb. each time. The result was, however, not very satisfactory. The serum was fairly potent but when the method was adopted as a routine measure it proved a failure as the animals lost condition rapidly and mortality increased among the serum makers. The other experiment was to increase the virulent material by injecting the virus producers at the time they were being bled out from the carotid and the jugular with lukewarm normal salt solution intravenously. The diluted virulent mixture was employed for hyperimmunisation of the serum producers and the bleedings done according to the routine procedure. The serum prepared by this method did not prove satisfactory. Later experiments by Dr. Edwards gradually led to the discontinuance of the 'hyperimmunisation' method and introduction of the 'immune' method, which will be described in the next article.

The method of hyperimmunisation described above is the subcutaneous. Another method which has been tried with varying

success both at the Muktesar and other institutes is the intraperitoneal. As the peritoneal fluid of the animals reacting to rinderpest was found to be rich in virus, experiments were carried out to ascertain if a potent serum could be produced by utilising the peritoneal fluid instead of blood for hyperimmunisation. As the quantity of peritoneal fluid in the hill bulls was small, it was considered advisable to inject other fluids into the peritoneal cavity to augment the natural fluid. At Muktesar the procedure was to inject into the peritoneal cavity of the virus producer two to three litres of warm Pot. Citras solution one hour before bleeding the animal to death. After bleeding out, the peritoneal fluid was removed and this was utilised for hyperimmunisation. The quantity of the peritoneal fluid removed would average 50 to 60 per cent of the fluid injected into the peritoneal cavity. Comparative tests of sera, prepared from animals hyperimmunised with virulent blood and peritoneal washings, revealed that the serum produced by the peritoneal washing method was slightly more potent than that produced by the virulent blood method. The method was not adopted as a routine measure for a long period as there were several disadvantages, such as the length of time needed for intraperitoneal injections and removal of fluid and development of abscesses.

Hyperimmunisation can also be performed by injecting into the peritoneal cavity of the serum maker citrated or defibrinated blood taken from the virus producers. The technique is not difficult of execution and the serum produced by this method of hyperimmunisation is as potent as the one obtained by the subcutaneous method. At Muktesar this method was introduced as an experiment and virulent mixture (equal parts of blood and Pot. Citras solution) injected at the same rate as in the subcutaneous method. The serum produced was as potent as in the latter method but it was discovered later that probably on account of faulty technique or other causes a good number of the serum makers showed on post-mortem, abscesses, blood clots and gelatinous deposits on the peritoneal wall and the method had to be abandoned.

(To be continued.)



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THE INDIAN VETERINARY JOURNAL.

Vol. XV.]

JULY 1938.

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Editorials.

VETERINARY TEACHING IN INDIA.

We are very grateful to the *Statesman* of Calcutta for editorially drawing the attention to the subject of 'Veterinary Teaching in India' and to the untenability of the proposal for starting a Central Veterinary College at Izatnagar. We have extracted that article in another page of this *Journal* and we commend it to our readers and to the authorities especially with the Government of India.

We have, in the previous issues of this *Journal*, commented at length on this proposal and have shown clearly how unsuitable the scheme is and what an extravagant expenditure it leads to. We had also reiterated that there is NOT ONE PERSON opposed to the principle of imparting the highest Veterinary Education in this land itself and of making this country self-contained so far as Veterinary needs were concerned. Our opposition and the opposition of the country has been only to the METHOD in which this is sought to be achieved. A Central Veterinary College in a remote corner of the country with no scope for clinical material in and around it, with curriculum framed more to obtain the approbation of the Royal College of Veterinary Surgeons in England than to meet the requirements of this country, with a capacity to turn out ten men in a year who, in all probability, "will be snapped up by the Army", and finally with an initial capital expenditure of nearly ten lakhs and recurring expenditure of nearly three lakhs a year—all these may appear incredible and fantastic but the

fact is that such a proposal is being seriously put forward and recommended for immediate adoption.

There are five Veterinary Colleges in this country and at least two of them are equipped in such a splendid way as to draw the admiration of every one who cares to visit and inspect them. Sir Frederic Hobday, the ex-Principal of the Royal Veterinary College, Camden Town, England, after his very recent tour of this country was pleased to remark that "these institutions have been so well planned out that he himself would at any time be proud to be the Principal of any one of them". It is difficult to get an authority greater than Sir Frederic Hobday to pronounce an opinion on the subject of Veterinary Education and the equipment of Veterinary institutions. His is an international personality of very great repute. When such an eminent person has pronounced such a favourable opinion about our Veterinary Colleges, we fail to see why these institutions should be ignored. The obvious thing, therefore, is to improve and develop these existing institutions and bring them up to the desired standard of proficiency and not waste money on a new venture of doubtful utility.

Again, if a small industrial country like Great Britain can boast of four up-to-date Veterinary Colleges, surely, a big agricultural sub-continent like India, with its 300 and odd millions dumb animals and its varied veterinary problems, can afford to have at least five Veterinary Colleges, each teaching up to the highest standard. This is not only not extravagant but an absolute necessity for the economic regeneration and improvement of the country.

There is one other point which we would like to mention here. With the advent of Provincial Autonomy in the Provinces, it is open to the popular Governments to tackle and solve their economic problems in their own way. The health and welfare of the live-stock of the province is an economic question and, therefore, we would not be surprised if, in due course, the men that are sent out from the proposed Central Veterinary College at Izatnagar were to find themselves, as regards their services, more or less in

a position similar to those of the officers of the present Indian Medical Service. We would therefore, in all earnestness, plead with the Government of India to drop this question of opening a Central Veterinary College, and direct their attention to the improvement of the Provincial Veterinary Colleges with liberal financial help whenever necessary.

THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH.

As is well known, the Imperial Council of Agricultural Research was constituted some years ago on the recommendations of the Royal Commission on Agriculture with a view to developing the Agricultural Industry of the country by initiating and co-ordinating research into the various problems relating to it. This Council has been mainly composed of the chief official heads of the various departments relating to Agriculture and Veterinary with a sprinkling of non-officials connected with the industry. This composition was probably more or less inevitable in the initial stages of its constitution and working. With the passing of time and with accumulation of experience, it is now highly desirable that the personnel of the Council is varied and made to include persons whose intimate knowledge of things in this country will be a great asset to the Council. For be it noted, each and every province has got its own Veterinary and Agricultural problems which have yet to be formulated and investigated and that only those, who have been in intimate contact and association with the actual working of the departments concerned, can be expected to give a correct lead to the solution of the various problems.

At present, there are a number of Veterinary officers in the different provinces who have in recent years retired from active service. These officers possess an intimate knowledge of the problems affecting the profession and, as matters stand at present, this knowledge is not being availed of by the State. If, therefore, they are nominated to the Council, they will not only be an acquisition to its deliberations but they will also enable the Council to plan out its policies on correct lines.

We, therefore, strongly suggest that some of those retired officers are nominated at an early date to this Council and thus utilise the knowledge at the disposal of these officers for the benefit of the country.

ANIMAL HUSBANDRY IN BENGAL.

We take the following from the *Hindu* of June 14, 1938 :—

“The *United Press* understands that the Bengal Government have decided to organise an Animal Husbandry Section under the Agriculture and Industries Department, the object of which will be to improve and protect cattle from diseases. To carry on the work of this new section, a Board has been formed with the Agriculture Minister, the Director of Agriculture, and the Director of Veterinary Department as Members.”

This is rather an indefinite news. We are not quite sure whether this new Animal Husbandry Section is to be under the control of Veterinary Department or not; nor are we sure of the nature of the agency which will be responsible for its proper running. At a time, when the Animal Husbandry management is being rightly handed over to the Veterinary Department in another province, and at a time, when such a step is being hailed as the correct one, it would be rather odd if the Bengal Government were to hand over this section to Departments other than Veterinary; because that would be a step retrograde in character and not calculated to further the objects in view. We, therefore, earnestly hope that our fears are not well grounded and that the Bengal Government have no intention of forming the new Animal Husbandry Section apart from the Veterinary Department there.



RETIREMENTS.

Sir Arthur Olver, Kt., C.B., C.M.G., F.R.C.V.S.

Colonel Sir Arthur Olver retired from his post as Animal Husbandry Expert, Imperial Council of Agricultural Research, India, on 26th May 1938. We hope, we cannot do better justice to his achievements than reproducing from the *Veterinary Record* of 4th June 1938, the tribute specially contributed to that *Journal* from one of his distinguished Veterinary colleagues resident in India, who is particularly well qualified to assess the immense value of Sir Arthur Olver's services to that great Empire.

* * *

When Olver arrived in India in April, 1930, to take up the appointment on the Imperial Council of Agricultural Research for which he had been selected in England a few months previously, after retiring from the R. A. V. C., he was initiating a new era in veterinary science and live-stock improvement work in India, and that country will ever have cause to remember the masterful and far-sighted manner in which he tackled the intricacies of his subject.

He arrived to find the fortunes of the Civil Veterinary Department at a very low ebb, for they had been without a veterinary representative with the Central Government for the previous 18 years. The arrangements in the different provinces for live-stock improvement work varied considerably in most cases consisting of an under-staffed veterinary department restricted in its efforts to the cure and prevention of disease, while other activities connected with the maintenance of animal health and development of animal husbandry were provided for separately and often inadequately. At the centre, apart from the Muktesar Institute which, up to that time, had concentrated on the control of bacterial, parasitic and virus diseases by the invention of suitable biological products or drug therapy, there were two small units dealing with Animal Nutrition and Dairy Research, while some three or four herds of milch cattle were maintained at the different central research institutes.

When one remembers that in Olver India had obtained an officer who, first and foremost, was a graduate in Veterinary

Science and a good judge of animals, combining a sound practical knowledge with a scientific outlook and a wide vision in all matters connected with animal health—in fact possessing all the attributes of a complete animal husbandman—and, if to these is added a great charm of manner, it is easy to understand why his tenure of the post on the Imperial Council of Agricultural Research should have been attended with such marked success!

After joining his appointment one of the first points which arose for decision was the designation to be given to the post which he held, which up to that time had been variously referred to as Veterinary Expert, Live-stock Expert, etc., and his foresight in selecting the designation of Animal Husbandry Expert has been amply confirmed on several occasions by subsequent events. One such occasion was the publication of certain figures, collected with the aid of a qualified statistician, relating to the value of the live-stock industry in India. These figures were received almost with consternation at the time, for they showed that the annual value of India's live-stock industry is greater than the value of her cash crops—a state of affairs—which, of course, has been shown to exist in several other countries, but had not previously been imagined to be the case in India.

Having demonstrated this enormous potential value of her animals and, no doubt, stimulated by recollections of early days spent under Theiler in South Africa, Olver set to work to organise a scientific background for the further development of these resources and, quite naturally, in a country which has long been the scene of some of the most devastating animal plagues existent, one of his first innovations was the introduction of a specially trained disease investigation officer in each of the major provinces and states. By a fortunate coincidence, it was just at this time that the Muktesar Institute, as a result of many years of patient work on the rinderpest virus, was able to place in the field its now well-known goat virus adapted for use as a vaccine against this condition, with the result that what previously had been an all-absorbing item of work in the programme of many of the provincial veterinary departments now became something to cause

far less anxiety to provincial Directors. These officers were thus in a position to avail themselves more freely of the help of the recently appointed investigation officers in combating the more obscure inhibitory cause of the development of stock in India, several of which have since been shown to be due to parasitic infection or nutritional defects.

The provision of proper facilities for the investigation of animal nutrition problems on a scale commensurate with their importance in a country like India also claimed Olver's attention at an early date and, no doubt, he would be the first to deplore the delay which has been experienced in placing this important part of any scheme of live-stock improvement on a proper basis. However, the stage is now set for advances in this subject, with the addition of a well-equipped and properly staffed animal nutrition section to the existing organisation at Izatnagar, the plains sub-station of the Muktesar Institute. This, together with the several subsidiary stations working on local problems in other places which received Olver's constant support, should provide India with a satisfactory means of dealing with this important subject.

From animal nutrition it is but a short way to human nutrition, and one of Olver's earliest steps was to point out the importance of milk in the diet of a human population largely vegetarian, and at the same time to emphasise the fact that the *per capita* consumption of milk in India is far below what it should be, largely due, no doubt, to the small amount of milk produced by the average Indian cow. From the records maintained by the Indian Military Dairies and others he was able to show, however, that many Indian breeds of cattle have latent milking qualities of great promise and his unremitting attention to this subject undoubtedly stimulated great interest in it throughout India, with the result that a special investigation of the whole dairy industry was undertaken in the cold weather of 1936-37 by an Expert from Great Britain whose recommendations, including the enlargement of the Central Dairy Institute, largely follow the advice already given by Olver and are now in process of being implemented.

During the investigation of the milking qualities of Indian cattle the question of pedigree breeding naturally arose and here Olver found a subject very close to his own heart. Owing to the indiscriminate breeding which has been practised in India for many centuries considerable difficulty is sometimes experienced in determining the claims of a so-called breed of cattle, and controversies on this subject will no doubt continue for many years to come, but as a result of Government intervention herds of several of the more important and undisputed breeds have been maintained in a state of purity for some generations past and these will now form the nucleus of a scheme of pedigree breeding in the appropriate breeding tracts in the Provinces and States, which Olver took great pains to foster. In the same connection he was instrumental in introducing Herd Book Registers for seven recognised milch breeds of cattle and buffaloes, and with the expansion of this scheme it may be anticipated that cattle breeding will not again fall into the haphazard methods which were generally in vogue in India until quite recent times.

In addition, the question of sheep and goat breeding also occupied Olver's attention and as a result some definite advances have already been made, particularly in the matter of developing some of the Indian breeds of milch goats. Nor was the poultry industry allowed to pass unnoticed and, although progress in this subject must necessarily be slow until more control has been obtained over the contagious diseases of poultry in India, yet the addition of a Poultry Research Section to the Izatnagar organisation, for which Olver was instrumental in obtaining sanction, should do much to place this industry on a better footing.

The provinces in India are now autonomous and even before Olver's arrival in the country the field staffs of the agricultural and veterinary departments had been transferred to provincial control, so that it is in the nature of things that he should have been able to introduce more improvements for the development of animal industry in the centre than in the provinces, but one point on which he was very insistent—and it is to be hoped that his efforts in this direction will not have been in vain—was that for

animal husbandry extension work in India, a separate organisation, incorporating the existing veterinary staffs and financed from the budget of its own, should be set up in each province and State to deal with all aspects of live-stock improvement. Such an arrangement has been accepted in principle as being the ideal one, but certain administrative details and the difficulty of finding a sufficient number of men completely equipped for this type of work have led to delay in its adoption in some of the provinces.

This brings us to the question of veterinary education, which is another subject to which Olver gave his attention. One of his first recommendations in regard to the provincial veterinary colleges, of which there are five in India was that, unless already provided, a dairy farm should be included in their organisation, in order that the training of students might have a greater bias towards Animal Husbandry and, in drawing up the scheme for a higher grade Veterinary College in India which was done under his direction, great stress has been laid on this side of the work and the subjects of Animal Nutrition and Animal Genetics will receive special attention in the curriculum.

If this proposed College be located at Izatnagar which is the present intention, and when the other contemplated extensions on this valuable site have been carried through, India will be able to boast of a central organisation for Veterinary and Animal Husbandry Research comparable with that of Onderstepoort in South Africa, and much of the credit for this must be allotted to Olver, who always gave the keenest support to any proposals put forward for the expansion of the Muktesar Institute.

It is sad, but perhaps inevitable, for Rome was not built in a day, that Olver should not be able to see the completion of all these projects, which he did so much to foster, but he can leave India with the feeling that in eight years he accomplished a vast amount of work and laid very sound foundations for the advancement of the subject, regarding which he was such an enthusiast. Moreover, the high standard which he set will act as a rare example for veterinarians to follow, not confined to the limits of the country of his most recent labours.

Realising the magnitude of his accomplished task, it was no surprise, but nevertheless very welcome, to his colleagues in India to read of the Knighthood which was conferred on him at the time of the Coronation of H. M. King George VI and those same colleagues now wish him God-speed and good luck in any further endeavours that he may undertake.

W. Taylor Esquire, M.R.C.V.S., D.V.H., I.V.S.

After studying farming in a practical manner for two-and-half years, Mr. W. Taylor joined the University of Liverpool for admission to the Membership Diploma of the Royal College of Veterinary Surgeons and graduated in 1910. He took his D.V.H. from the same University in 1911 and engaged himself in private Veterinary practice during 1911-13.

Mr. Taylor joined the I.V.S. in 1913, and was posted to the C. V. D., Punjab, from where he was transferred to the Punjab Veterinary College, Lahore, in 1914. He studied at the Central Research Institute, Kasauli, during vacations of 1915 and 1916, and was sent by the Government of India to Bushire (Iran) in 1917, to investigate the mortality amongst the camels. He was appointed as Professor of Pathology and Parasitology, Punjab Veterinary College, in 1920, and promoted to the rank of Principal in 1927, on retirement of Col. G. K. Walker, C.I.E., O.B.E., V.D., F.R.C.V.S.

He worked on Foot-and-Mouth Disease and studied the characters of the Indian and English viruses and tried chemotherapy. In eczema of dogs he was the first to try vaccine treatment. He made various experiments to study Canine distemper and introduced the use of Distemper vaccine in the Punjab.

Mr. Taylor officiated as Director, Imperial Veterinary Research Institute, Muktesar, during 1930-31, 1933-34 and 1937-38.

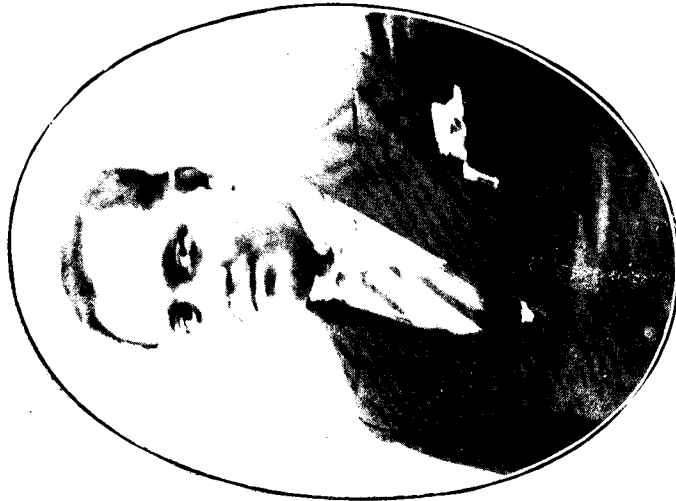
His chief activities have been the improvements of Horse Racing and Horse Breeding. He acted as Honorary Secretary of



COL. SIR ARTHUR OLIVER, Kt.,
C.B., C.M.G., F.R.C.V.S., F.N.I.,
*Retired Expert Adviser in Animal Husbandry to the
Imperial Council of Agricultural Research, India.*



MR. W. TAYLOR, M.R.C.V.S., I.V.S.,
Retired Principal, Punjab Veterinary College.



CAPTAIN S. C. A. DATTA, B.Sc., M.R.C.V.S.,
Official rapporteur for India at the
XIII International Veterinary Congress,
Zurich.



RAO SAHIB K. KYLASAMIER, G.B.V.C.,
Retired Superintendent, Madras Serum Institute.

Retirement of Rao Sahib K. Kylasamier, G.B.V.C. 47

Lahore Race Club from January 1915 to September 1923, Steward in 1916, and Senior Steward from August 1918 to April 1938.

He was Vice-President of the Horse Breeding and Show Society of India three times.

We wish him happiness and prosperity in his retirement and many more years of useful service to the profession.

Rao Sahib K. Kylasamier, G.B.V.C.,

Retired Superintendent, Madras Serum Institute.

Rao Sahib K. Kylasamier, the seniormost member of the Madras Veterinary Service, retired from service on 9th June 1938, after a distinguished career of over 32 years. In unveiling his portrait in the Madras Veterinary College on 18th June 1938, Mr. P. T. Saunders, Director of Veterinary Services, paid a glorious tribute to the meritorious services rendered by him in various capacities to the Civil Veterinary Department in this Province.

Soon after graduating from the Bombay Veterinary College he joined the staff of the Madras Veterinary College as third Lecturer in 1906. Three years later he was transferred as Inspector for District work.

In 1912, when the ravages of Rinderpest became acute in the Kistna District, Mr. Kylasamier was selected to organise a Mobile Corps to combat the heavy mortality.

His work in the districts, especially in connection with the control of Rinderpest in the Presidency, was so successful and outstanding that his advancement in the service was only a question of time. He was promoted to the gazetted rank in 1917, to fill one of the three newly sanctioned posts of Deputy Superintendents of the Department. During his stay at Coimbatore in charge of the circle, the serum-simultaneous method of inoculation against Rinderpest was successfully handled and extensively practised.

In 1928, he proceeded to the United Kingdom on study leave for post-Graduate work. On his return he was posted to the Madras Veterinary College. In 1932 came another important period in his service, when he was chosen to be in charge of the newly sanctioned Serum Institute at Madras.

It is no exaggeration to say that the success of the Serum Institute was in no small measure due to the initiative and enterprising skill which Mr. Kylasamier brought to bear in the successful production of Biological products at this Institute for the prevention of diseases of cattle, notably Rinderpest. It may be stated that, during the six years or so he remained in charge of the Institute, Government was able to save over ten lakhs of rupees. In recognition of his services the Madras Government was pleased to confer the title of Rao Sahib on him in June 1936.

Prior to his retirement he has, on three occasions, acted as Principal of the Madras Veterinary College with conspicuous ability and success.

We wish him long life and prosperity and many more years of useful service to the profession.

Messrs. A. Ramachandra Iyer, G.M.V.C.,

AND

K. S. Natesa Iyer, G.M.V.C.

During this year two other members of the Madras Veterinary Service, Messrs. A. Ramachandra Iyer and K. S. Natesa Iyer, also retired from service.

Mr. A. Ramachandra Iyer, after graduating from the Madras Veterinary College in 1907, started his career as a Veterinary Assistant Surgeon and by dint of honest and hard work rose to the position of Veterinary Inspector and later of District Veterinary Officer. He also served for some time as a Lecturer in the Madras Veterinary College before he was promoted to the gazetted rank. He served as a District Veterinary Officer in various parts of the Presidency.

Mr. K. S. Natesa Iyer also graduated from the Madras Veterinary College in 1908, and joined the Department as a Veterinary Assistant Surgeon and after a few years was promoted to the Inspector's rank in which capacity he served in the City of Madras in charge of Glanders work. From this position he was elevated to the gazetted rank and posted as District Veterinary Officer which post he held till retirement.

We wish them both long life and all happiness to enjoy their well-earned rest. We trust they will continue to take interest in the welfare of the profession.

A PRINCELY DONATION.

We publish elsewhere in this issue the announcement of a princely donation for the development of Animal Husbandry and Genetics in the Bombay Presidency and we heartily congratulate MRS. IRWANTI MANSUKHLAL, wife of the late Mr. Mansukhlal Chhaganlal, on her philanthropic act to a cause which has been the subject of much neglect in this country. As is very well known the prosperity of the ryot of this country depends upon the welfare of his live-stock and, therefore, all measures of rural uplift must necessarily be devoted to improvement of the live-stock of the land. Animal Husbandry is one of the vital industries of this country and it is, therefore, a matter of extreme satisfaction that a donation of this kind which, we understand, is the first of its kind in the whole of India, has come out of the private purses of a rich magnate of this country. In giving practical shape to this magnificent donation we would like to impress upon the Government the absolute necessity of devising proper ways and means for utilising the amount.

It has been our experience in the past that many a scheme has miserably failed on the sole ground that those schemes were in the hands of men not properly equipped for the purpose. Animal Husbandry and Genetics are subjects which are the prime concern of the Veterinarian and it is he and none else that can do full justice to these subjects. By his education and

profession he is the competent man for the purpose and we earnestly hope and trust that the Government, into whose hands the money has been put, will see that the right type of Veterinarians are appointed in the initial stage of the launching of the scheme itself. There is no dearth of men with the necessary equipment and experience needed for this in this country and it should not, therefore, be difficult to select a suitable and correct type of Veterinary Officer.

Now that Bombay has set this noble example, we trust that other provinces, which do not lack in wealth and money, will follow suit.

Clinical Articles.

NOTES ON TWO OF THE MILK-BORNE DISEASES.

BY

C. K. VELAYUTHAN NAIR, G.M.V.C.,

Touring Veterinary Assistant Surgeon, Coondapoor.

Milk is a very common food of almost all—the rich and the poor, the young and the old. This is the reason why cows, which supply us with this complete food, are worshipped by all, more especially by the Hindus. Everyone knows that we should drink good milk. Good milk can be defined as the milk obtained from a well-nourished cow or she-buffalo that is absolutely healthy and free from especially contagious diseases that affect both cattle and human beings. The milch cow or she-buffalo, whatever it may be, should be well nourished; because only the milk obtained from such animal contains all its constituents in the proper proportion. Generally children who are entirely fed on milk obtained from under-nourished cows suffer from the so-called deficiency diseases. The most common diseases borne by milk are:—

(a) Tuberculosis; (b) Pox.

(a) **Tuberculosis.**—This is a chronic, contagious and infectious disease affecting most animals, besides man. The disease is characterised by gradual wasting.

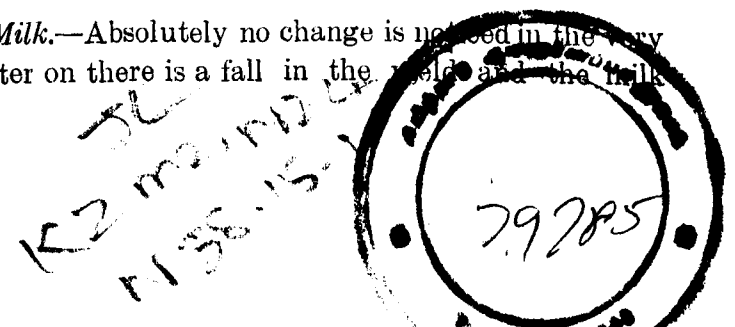
The cause of this disease is a bacillus, popularly known as '*Bacillus tuberculosis (Microbacterium tuberculosis)*'. They remain in the lesions and could be detected under the microscope on examination of discharges such as sputum, fæces, milk and even urine, etc., from a tuberculous patient. The bacilli are clinically divided into three types—Human, Bovine and Avian. These three types are not ordinarily confined to their respective species. Bovine type is the most virulent of all and it has been found to affect children and sometimes adults as well. In the same way the human type, which is second to the bovine type in its virulence, affects some of the animals, viz., dog, cat, pig, fowl, monkey, etc. Avian type, the least virulent of all, is generally confined to the birds though it may sometimes affect pigs. Regarding the viability of the bacilli they may remain outside as long as 3 to 5 months. The organisms are not killed by the gastric juice in the alimentary tract.

Transmission of the Disease to Children.—The disease is generally transmitted to children by drinking milk obtained from a tuberculous cow. An affected cow may not exhibit marked and diagnostic symptoms in its early stages as the course of the disease is very slow and chronic except in the so-called "Milking form" when the progress is rapid resulting in the death of the patient in about three weeks.

The Source of Infection in Milk.—In every case of tuberculosis the bacilli may not be discharged in milk. This is so when the lesions are shut up as in closed tuberculosis. The bacilli are found in milk only when the udder is affected, or by contamination through careless handling of milk.

Symptoms.—The affected udder is hard and a little swollen. Pain is often absent. It is the hind quarters that are generally affected. Nodules may be felt on manipulation.

Changes in Milk.—Absolutely no change is noticed in the very early stage. Later on there is a fall in the yield and the milk becomes watery.



Prevention.—Care should be taken in the management of the live-stock, particularly the housing of cows, proper grazing, cleanliness, etc. Animals that are suspected to be tuberculous should be tested and at once destroyed if it is positive to it.

(b) **Pox.**—This is a specific contagious disease characterised by high fever and formation of pustules on the skin of the udder. Pox is seen in all bovines, frequently in cow, man, sheep and goat. It is very severe in man and sheep.

The cause is a virus generally present in the pustules. The disease in cows is called Cow-pox (*Vaccinia*). Men get the infection from cows through milk. The cows may get infected from men too. Ordinarily the cows get infected by cutaneous inoculations through the hands of milkman.

Treatment and Prevention of Pox.—Keep the affected animal separate from the rest and clean the udder every day with some antiseptic lotion. The affected animal should be carefully nursed and milked last. The milk from such cows should be boiled before use. The virus will be killed by heating it at 60° C. for five minutes.

ULCERS—THEIR HEALING BY SKIN GRAFTING.

BY

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

Veterinary Assistant Surgeon, Narasaraopet.

Subject.—A bullock which was yoked to the oil mill at Narasaraopet town, Guntur District, had an ulcer at the yoke place with no tendency to heal. It was found inconvenient to bring the edges of the wound together. It was therefore decided to heal the wound by grafting over the area with pieces of healthy skin taken out from another part of the same animal.

The ulcer commonly known as yoke gall will be very much thickened and indurated due to friction. Under sterile conditions all the hardened portions close to the subcutaneous tissue were

removed to get a smooth area to receive the graft. Then the tough portion was removed and the ulcer washed with one per cent saline solution. Afterwards small pouches were made at different places over this area. The object of this was to keep the grafts in position instead of a bandage which is difficult to apply on the yoke place. Hæmorrhage was stopped by pressure. The ulcer was then covered with cotton wool soaked in saline solution.

At the same time a portion of the skin on the hump was washed with soap and water. The part was shaved with a sharp razor and was again washed with sterile saline solution, one per cent, and then covered with cotton wool soaked in the same solution.

The next procedure was to take out thin small pieces of skin from the hump and adjust them into the various pouches which were one-eighth inch in length. Those so-called pouches were not complete and they overlapped only the edges of the grafts to keep them in position leaving the centre of the graft uncovered. After all the pouches were filled with the edges of grafts and air and blood clots were gently pressed out with moist cotton wool, the whole area was covered with a thin layer of cotton wool soaked in sterile one-per-cent saline solution. Sterile vaseline smeared on sterile cotton was kept over that layer of moist cotton wool. This moisture was absolutely necessary to protect the grafts.

The above procedure was adopted on the 3rd of August 1936. From the 4th to the 13th of August, sterile cotton wool smeared over with sterile vaseline was renewed. The grafts adhered on the 6th day. By the growth of grafts prominent patches of skin were formed on the ulcer. Zinc oxide ointment was used when the grafts began to grow and the animal was discharged cured in less than three weeks.

EXPERIMENTAL FACTS ABOUT GOAT VIRUS.

BY

P. SHAH ALAM KHAN, G.M.V.C.,
Veterinary Assistant Surgeon, Madakasira.

Three goat-blood virus camps were arranged each camp containing 150, 620 and 675 animals respectively. Each animal was vaccinated with $\frac{1}{2}$ c.c. virus. There were no perceptible reactors at all in the first camp. In the second camp there were about 60 per cent mild reactors and about 40 per cent moderately severe, exhibiting the following symptoms:—off-feed, cough, staring coat and diarrhoea. In the third camp all the animals reacted and about 70 per cent moderately and 30 per cent severely exhibiting the following symptoms: off-feed, severe cough, muffle dry, staring coat and actual shooting foetid diarrhoea in some only. Animals lost condition very rapidly and were unfit for work for over a month. There was very rapid and marked fall in the milk yield.

No serum was used to check the reaction. All the same there was no mortality in any of the three camps.

My conclusion from the above is that there is variation in susceptibility in different cattle in different localities or the brew of virus varies in its attenuation.

LOSS OF AN EYE OF A HORSE DUE TO WASP STING.

BY

ABDUL MAJID N. SIDDIQI, G.P.V.C.,
Veterinary Inspector, C. V. D., Sind, Karachi.

Some years ago when I was in charge of Civil Veterinary Dispensary, Larkana, Sind, some horses belonging to the Police Force were doing duty in a jungle. One horse was tied to a tree, in the thick branches of which was a big "Wasp-hive" (locally known as Khakhar). These yellow wasps are in abundance in the forest area on the banks of the Indus in Sind. Perhaps the horse quite innocently rubbed himself against the tree and shook it well. This enraged the swarm of wasps and they attacked him

furiously, stinging him on all parts of his body, specially eyelids, lips, sheath and abdomen. The poor creature being quite helpless against his tiny-winged enemies was so much excited and terrified that he kicked, jumped and broke himself free and ran wild. With great difficulty he was caught and brought to the Veterinary Dispensary for treatment. His head being enormously swollen, he looked like a monster. There were diffused swellings on the whole body specially on the sheath and abdomen. Temperature was high and there was some difficulty in breathing. The horse could not eat and drank water with difficulty. Diluted Liquor Ammonia was gently rubbed on the swelling by way of treatment. Linseed tea was given as a drink and frequent enemas of soap and water were given to unload the bowels. The horse could not eat for two days and appeared in great distress. Having intense irritation he rubbed one of his eyes against the wall of the stable and punctured it so badly that the aqueous humour escaped and crystalline lense got displaced. After two days he was able to pick some green grass and ate some bran-mash, but the eye was still swollen, very painful and discharging mucopurulent matter. When acute symptoms subsided the horse was cast and the eye ball was removed under general anaesthesia. The wound healed up finally and the poor one-eyed horse was given light duty consequently.

A CASE OF FIBROMA OF UDDER IN A COW.

BY

KARTARCHAND ASSI, G.B.V.C.,
Veterinary Assistant Surgeon, Barwani State, C. I.

Subject.—A six months pregnant cow, aged 10 years, in fair condition, Nimadi breed.

History.—Nine months ago a small swelling was noticed in the udder by the owner. The cow was treated by the owner himself. When he found that the swelling was not reducing, he pierced it with a sharp hot iron. The swelling, however, continued to grow and attained the size of a water-melon. The animal was brought to the Veterinary Hospital on the 18th of December 1937, for treatment.

On examination of the udder it was found that both the teats on the left side had completely atrophied and were on top of the tumour about 9 inches below their normal position. The other two teats were normal.



Fibroma of Udder in a Cow.

Treatment.—The animal was cast and the part was thoroughly washed with antiseptic lotion. The skin was cut all round the peduncle of the tumour and the peduncle was ligatured and the tumour excised. There was very little hæmorrhage. The skin was sutured and a small opening was left for drainage. The wound healed up by first intention and the cow was discharged cured on the 2nd of January 1938.

This is the first case of Fibroma of Udder in a bovine seen and treated by me.

UNUSUAL SEAT OF BLACK-QUARTER LESIONS.

BY

B. M. LAHIRI,

Veterinary Assistant Surgeon, Nawadah, Bihar.

On the morning of the 21st of August 1937, one local grocer appeared at the dispensary with a pack bullock for its treatment. He stated that he came as usual from his village with merchandise on his bullock to Nawadah and stayed at some other's shop, on the previous day. In the evening he noticed that the bullock was off-feed and that a swelling had appeared under its jaw. The bullock was in good condition and exhibited the following symptoms: pulse weak and thready, temperature sub-normal, respiration difficult and sterterous, mucous membrane cyanotic, hard swelling under the jaw, blood stained discharge profuse from the nose, abdomen tympanitic and bowels constipated. Apparently the symptoms were more or less that of Hæmorrhagic Septicæmia. The animal died soon after admission.

Post-Mortem Findings.—(1) Œdematous swelling in the sub-maxillary space and on the pack saddle place behind the hump with sanguineous infiltration of the tissue underneath, the muscles of the places were black in colour having the characteristic smell and look of lesions of Black-Quarter.

(2) Tongue swollen, and at the back portion one old ulcer was present.

(3) Pharynx was congested and dark in colour with œdema of the mucous membrane.

(4) Nasal cavities contained sanguineous fluid.

(5) Highly congested with œdema of the glottis and hæmorrhages underneath. Trachea contained frothy fluid.

(6) Mesenteric lymph glands were swollen and congested.

Other organs.—Nothing unusual.

Diagnosis.—Black-Quarter.

Laboratory examination of the muscles and muscle juice confirmed the above diagnosis.

It is most probable that the infection took place through the ulcer in the tongue through contaminated food.

NIGHT BLINDNESS AND CATARACT IN BULLOCKS. (A DEFICIENCY DISEASE ?)

BY

L. M. LAHIRI,

Veterinary Assistant Surgeon, Nawadah, Bihar.

Nyctalopia and also cataract of one or both eyes is fairly common in cart and pack saddle bullocks in this locality. The bullocks are generally in good condition yet they develop night blindness or cataract. Symptoms are evidenced by their staggering and faltering gait at night or even striking against walls or objects in front, inability to cross over drains, etc.

The diet of these animals consists of split khesari, oilcake, and kutti (chopped paddy straw) or bhusa (dry wheat, gram, khesari stalks powdered). No green fodder is supplied to these animals. Apparently there is deficiency of vitamin A in the above ration. I had no opportunity to examine the eyes with an ophthalmoscope or study the histopathology of the retina of the eye in such cases, hence I am unable to describe the particular changes that take place there. An allied condition is met with in man in which the deficiency of vitamin A produces retinitis pigmentosa and other changes. With this in view I adopted the following treatment:—The bowels were first attended to, followed by a course of tonic containing nux vomica. The owners were also advised to supply sufficient green fodder along with the usual grain feed. Animals so treated showed considerable improvement in their eye sight as regards night blindness, but I could not trace the cataract cases which were also treated in the same manner.

SHOCK PRODUCED BY THE BITE OF A HONEY-BEE ON A DOG.

BY

PREM NATH KAK, L.V.P. (HONS.),

Veterinary Officer, Bodyguard Cavalry, Srinagar.

Mr. H. S. Bawa, M.R.C.V.S., desires to know of any other Veterinarian having had experience of similar kind as referred to by him in his article in July (1937) issue of this *Journal*.

Three years ago, one noon, I was just going out to a cattle farm when I got a telephonic message from Brigadier H..... to call at his residence immediately.

I hurried and to my surprise found his spaniel dog panting with an enormously swollen head.

He ran a temperature 105° F. The bee that stung the dog was preserved by him for my inspection. The dog was stung on its cheek and the red spot showed the point of the sting. The dog could not move and was dyspnoic. When forced to move he staggered.

The stung point and the area around was rubbed with Liquor Ammonia solution and the swelling was fomented at intervals.

He was given egg flip with brandy to act as a stimulant.

As the dog was a very pet one, I was requested to stay with him the whole day till 6 in the evening when his temperature subsided and he drank milk *ad libitum*. The swelling was slightly reduced. He was given liquid paraffin overnight and in a couple of days he was normal.

CONTAGIOUS EQUINE PNEUMONIA—TREATMENT WITH NEOSALVARSAN.

BY

G. F. STEEVENSON.

(*J. Royal Army Veterinary Corps*, 8, 4, pp. 171-72.)

Ref. : P. 336, Vol. 50, No. 11 of *Vet. Record*, 12th March 1938.

Thirty-three cases of contagious pneumonia in horses of the Indian Cavalry have occurred since the outbreak began. Heavy rains appeared to predispose animals to attack and there was no evidence of direct contagion. A temperature of 104 to 106° F. for a period of 6 to 7 days, marked patechiæ on conjunctiva, a short painful cough and dull areas on percussion were the principal symptoms manifested. In cases treated with Neosalvarsan, a rapid amelioration in the symptoms occurred and the mortality was nil, whereas horses treated by the more commonly adopted methods showed a much longer course of illness and a few died.

USE OF OMNADIN VET. IN CANINE DISTEMPER AND FEVER OF UNKNOWN ORIGIN.

BY

JATINDAR NATH,

Veterinary Assistant Surgeon, Amritsar.

(*U. P. Veterinary Journal*, February, 1938.)

Introduction.—Omnadin is prepared by Behring Institute, its sole agents being the Haverro Trading Co., Ltd., India. It is a mixture of albuminous bodies, bile lipoids and animal fats. All these substances possess anti-genic properties. It seems that Omnadin acts by increasing the natural defence forces of the body.

The following brief note of five cases of Canine Distemper and fever out of many, treated in the Veterinary Hospital,

Amritsar, with Omnadin vet., may be of interest to members of the profession :—

CASE 1. Spaniel Bitch. Outdoor No. 4493, dated 17th August, 1937. High fever of unknown origin. Blood negative for protozoan parasites. Lachrymation of the eyes. No appetite, diarrhoea. Febrifuges given with no good results. The case became hopeless. As a last resort after the 6th day Omnadin 2 c.c. injected intravenously. The fever came down after the third injection. The same bitch was examined after two months and she was found to be in perfect health.

CASE 2. Spaniel dog, 4 years old, outdoor No. 6107, dated 7th October, 1937. High temperature, refusing food and drink. Nasal catarrh and cough. Lungs normal. Blood normal. One injection of Omnadin 2 c.c. was given intravenously on the third day of the disease. Two injections brought the temperature down. Three more injections were given subcutaneously on every alternate day. The dog was cured after five injections. The condition of the same dog could not be seen afterwards.

CASES 3 and 4. Pups four months old. Outdoor Nos. 6225 and 6285, dated 12th October, 1937 and 15th October, 1937. Both these pups were suffering from advance stage of distemper. Emaciated condition, constipated, high temperature, purulent discharge from eyes and nose. Loss of appetite, Exanthema. Treatment was started on the fourth day after giving castor oil. Only three injections to each cured the disease.

CASE 5. An eight-year-old bitch. Outdoor No. 6325, dated 16th October, 1937. Showing nasal catarrh, high temperature, constipation, blood negative. Omnadin 2 c.c. injected subcutaneously. Third injection brought down the temperature, but the condition remained the same, running down pulse. Stimulants given. Bitch died after fourth injection.

Conclusion.—The conclusions drawn from all these cases treated are that:—

- (1) Omnadin vet. is a useful preparation, which can be used safely in cases of canine distemper.
- (2) It is tolerated by young and old dogs.
- (3) Its injection is painless and harmless.
- (4) This product does not seem to be effective in advanced stages of distemper.
- (5) It does not give any immunity against distemper.

CREOSOTE POISONING OF CATTLE.

BY

G. HANLON,

Inspector of Stock, Gundagai, N. S. W.

(The Australian Veterinary Journal, 1938, Vol. 14, No. 2.)

This brief note concerns the loss, from what appears to have been creosote poisoning, of four steers and two cows from a lot of ninety-four head of cattle running in a little paddock of fifty acres. An electric light line was being erected through the paddock and the poles were treated with creosote before being placed in position in the ground. The creosote was applied to the poles while lying on the ground and was also placed about the poles after they had been erected.

Symptoms in affected animals consisted of extremely rapid respirations and evidence of burning over the mucosa of the mouth, tongue and lips, which were white and hardened. The pupils were contracted, the skin was cold and the animals were in a comatose condition. Faeces were black in colour and the affected animals were apparently in great agony. In the early stages they evinced great thirst.

A steer in *extremis* was killed and an autopsy carried out immediately. The first three stomachs were apparently normal but the fourth stomach contained a fair quantity of black liquid

in which an oily substance was seen. This black fluid was present along the alimentary tract to within a few feet of the anus. Intense inflammation and congestion was evident in the whole gastro-intestinal tract.

There was evidence that the creosote had been ingested by the cattle while the poles were lying on the ground over-night, and after they had been treated with the preparation.

The authority erecting the poles and the manufacturers of the creosote both expressed the opinion that cattle would be most unlikely to lick the creosote, and that they would have to take it in large quantities for ill-effects to be produced, but subsequent enquiry has indicated that a mortality of this nature has occurred previously.

The literature has little reference to creosote poisoning, although Lander (1926) mentions cases of poisoning in stock which had access to creosoted railway sleepers. The firm which supplied the creosote gave its specific gravity at 20/20° C. as 0.962 and the total tar acids by volume as 10.2 per cent. 1 per cent of the sample distilled below 205° C., 13 per cent below 230° C., and 84 per cent below 315° C.

It is understood that action has been taken to prevent mortalities of this nature occurring in the future.

REFERENCE.

Lander, G.D (1926)—*Veterinary Toxicology*, Bailliere, Tindal and Cox, London.

TRANSMISSION OF ANTHRAX TO MAN BY *ARGAS PERSICUS*.

BY

A. W. T.

(The Australian Veterinary Journal, 1938, Vol. 14, No. 2)

During the course of some investigations with the fowl tick *argas persicus* a laboratory worker noticed a large nymph attached

to his hand. The bite was quite painless and surrounded by a reddish zone 5 mm. in diameter which remained completely anæsthetised for fifteen minutes. The tick, as judged from its state of engorgement, could not have been affixed for more than two or three minutes. A sketch of the hand and the point of attachment was made. Fourteen days later exactly at this point an anthrax pustule developed, which responded well to anti-anthrax serum (apart from a marked serum sickness) and intravenous Lugol's iodine solution.

The source of the infection of the tick is unknown.

REFERENCE.

- Paterson, J. S., and Heatley, T. G. (1938)—*Vet. J.*, 94, 33.
Delpy, L., and Kawoh, M. (1937)—*Rev. Path. Comp.*, 37, 1229.

FREAKS OF NATURE.

BY

A. R. KUPPUSWAMY, G.B.V.C., P.G. (MAD.),
Assistant Veterinary Surgeon, Penang, S. S.

A Calf with Six Legs.—This calf was born on the Coronation Day (12th May), 1937, at a place called Pekan Darat in Province Wellesley North.

Photographs, Nos. 1 and 2 Plate III, were taken on 16th May, and No. 3 on 27th November, 1937.

The legs are attached to the shoulder joint of the off fore leg and are shorter than the fore legs. These additional legs can be moved and made to rest on the neck. The calf is going lame off fore as more weight is put on this limb. The horizontal axis of the body is inclined downwards towards the head.

Piebald Buffalo.—The photographs, Plate IV, are of a Sumatra male buffalo aged three years and nine months. Such PIEBALD buffaloes are rare.



Photographs of a Calf with Six Legs.





Photographs of a Piebald Buffalo

Notes

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The body, the legs, the tail and even the eye (wall eye) are half white and half black, the anterior half of the iris being depigmented.

As far as our experience goes, when a male or female white (albino) buffalo is mated with a female or male black buffalo, the result is always a black offspring.

It is only when mating takes place between a white (albino) male buffalo and a white (albino) female buffalo or *vice versa*, a white (albino) buffalo calf is born.

We do not know what combination produced this colour!

I am sure the publication of this will be of interest to cattle breeders. We imported some animals for slaughter from Sumatra and this one arrived in one of those batches.

[Such buffaloes are common in Southern India.—The Editor]

Notes.

We feel glad to learn that Captain S. C. A. Datta, B.Sc., M.R.C.V.S., Veterinary Research Officer, Imperial Veterinary Research Institute, Muktesar-Kumaun, India, has been appointed the official rapporteur for India at the Thirteenth International Veterinary Congress, Zurich, and India's delegate to the Imperial Veterinary Conference in London. He shall be presenting a paper entitled "New Researches on Some Helminthic Diseases of India" at Zurich, and one on "Bovine Hæmaturia" at the London Conference.

* * *

Captain Datta was born in 1899 and qualified as M.R.C.V.S. in London. He was one of the first University Graduates to enter the Veterinary Profession in India. In his student career he received instructions from Sir C. V. Raman, Sir P. C. Ray, and Sir John McFadyean. He was first appointed as a Lecturer in the

Bengal Veterinary College and worked with the late Colonel Acton. He has been a Research Officer at Muktesar since 1930.

* * *

He advanced the remarkable idea of co-ordinating, under one live-stock department in India, the four branches of animal husbandry, nutrition, genetics and diseases, which is evidenced in his paper read before 'Cow Protection' Conference in 1929 (*I. V. J.*, Vol. V, p. 380). Those who have come in contact with Captain Datta or have perused his scientific or other publications have been much impressed with his intellectual capacity, his diligence and foresight in attacking disease problems. His achievements in the field of original researches are well known, and have already found a place in text books and other publications under several heads.

* * *

The Pathology Section of the Muktesar Institute under his able management has for years rendered an eminently satisfactory service to all field workers who required its assistance in many and varied conditions. His work has amply demonstrated what we have stressed for many years that, given opportunities and fair play, there exist promising *Indian Veterinarians* who can rank equally with the best of any other country. Captain Datta has opened up the field of fundamental work in animal husbandry matters. Those, that have attended his lectures to post-graduate classes, have always been inspired with a greater enthusiasm for serving the country and the live-stock population. Government of India are to be congratulated on their decision in choosing an Indian Scientist as rapporteur and it may be said confidently that their choice will bring name and fame to India.

* * *

We invite the attention of our readers and the authorities concerned to the Editorial of the *Daily Gazette*, Karachi, and the special article by 'Candidus' referred to in it, published elsewhere in this issue of the *Journal*.

We are glad that the general public and the lay press in the country have begun to interest themselves with the live-stock and veterinary problems. Really this augurs well for the future development of the live-stock industry.

* * *

The Proceedings of the Annual General Meeting of the Bombay Veterinary Medical Association published in *this issue* will show the keen interest with which the venerable and learned President of the Association has been watching the developments in all matters wherein the veterinary profession has to contribute its own quota of service for the general welfare of the community. He has given a good lead in his address on many important matters engaging at present the attention of the public and the authorities and it is up to every Veterinary Surgeon and organisation to follow the lead and carry on educative propaganda on the lines.

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We shall be glad to publish the views of our readers, in these columns, on the draft proposals of Mr. R. R. Joshi appearing in *this issue* and referred to in the Resolution No. 10 of the Bombay Veterinary Medical Association Annual Meeting.

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The Honourable Minister for Agriculture, Bombay, has been reported to have said, in declaring the Annual Meeting of the Bombay Veterinary Medical Association open, regarding the transfer of the Bombay Veterinary College to Poona City "Rather he thought there was not much scope for the beneficial use of the Veterinary Science in the City. Rural surroundings were best suited for the successful work of the College.....A majority of the students were drawn from outside the City and the location of the college, therefore, should be decided to suit the convenience of students and for the benefit of the presidency."

* * *

Yes, the majority of the students are really drawn from outside the City (Bombay). For a matter of that, this is the case

with every Veterinary or any other professional college in any city or town. It is so even in the case of almost all the Arts colleges. Even if this Veterinary College should be transferred to Poona City, majority of the students will be still drawn from outside that city. This will continue to be the case in the case of any institution in this country which is a land of villages.

* * *

Regarding rural surroundings for a Veterinary college, this *alone* will not suffice for the successful working of a Veterinary college and Poona City cannot be said to possess this in abundance. We have shown on a previous occasion in these columns that Bombay has got many facilities for the successful working of a Veterinary college from many points of view such as academical, scientific, medical, research, clinical and others—all quite essential for scientific Veterinary Education. Poona City cannot be said to be rich in all these matters. The authorities should not make any attempt to force the transfer of this college from such surroundings at any time irrespective of funds or no funds.

* * *

The continuance of the College under such important and favourable surroundings in Bombay City will benefit the Presidency even much more than its transfer to Poona City where such facilities are lacking. We have, therefore, no hesitation in telling the Government of Bombay not to entertain, at any time, the idea of transferring this College from its present advantageous centre.

* * *

Our readers will find in *this issue* 'Results of Marketing Survey of Cattle in Madras Presidency'. It is a very interesting and instructive report, though brief. We find that many of the suggestions for the improvement mentioned at the end of the report are in agreement with what has been often said by *this Journal* on this subject.

* * *

The Third United International Congress of Tropical Medicine and Malaria will be held at Amsterdam from 24th September to

1st October 1938. The membership fee for members is £ 1-0-0 and for associated members is £ 0-10-0. Professor Grijus and Professor Swellengrebel are the Chairmen of the Congress. Further information concerning the organisation of the Congress can be had from the General Secretary.

* * *

A cow has just died at Fjusgesta, Central Sweden, which had lived, apparently, in good condition, for six months with a large turnip knife in its heart. Some six months ago the cow was seen to be ailing and a Veterinary Surgeon diagnosed inflammation of the heart. The cow appeared to recover, however, and shortly afterwards calved, while its milking capacity did not seem to be affected. A few weeks ago the animal was found to be so weak that it had to be slaughtered, and on its being cut up the turnip knife was found transfixing the heart. The farmer recognised the knife as one he had missed after cutting up turnips for his livestock a few days before the cow first showed signs of sickness.

— *The Hindu*.

* * *

We extend a hearty welcome back to Mr. K. S. Nair, M.R.C.V.S., of the Madras Veterinary College who went to the United Kingdom a year ago for post-graduate studies, and who is expected back in a couple of days. He spent a year at the Edinburgh Veterinary College and has been the recipient of the Diploma in Tropical Veterinary Medicine. He is the first South Indian to secure this relatively new degree. On his return he will be posted as Superintendent of the Serum Institute, Madras.

Association News.

BOMBAY VETERINARY MEDICAL ASSOCIATION.

Proceedings of the Annual General Meeting of the Bombay Veterinary Medical Association held on the 16th and 17th April, 1938, at the Old College Hall of the Bombay Veterinary College, Parel, at 4 p.m. (S. T.).

There were present: Khan Sahib N. D. Dhakmarvala; Messrs. H. B. Shirsathe, R. N. Naik, V. N. Kulkarni, R. P. Vedak, A. G. Khair, S. B. Hanchlikar, J. H. Unerkar, T. R. Khaladkar, K. K. Kanade, A. H. Khan, C. N. Desai, P. B. Cardmaster, R. G. Sathe, S. J. Khambete, J. G. Gokhale, K. M. Vaidya, D. S. Laud, B. N. Sangali, S. R. Nadgir, V. M. Hegadikatti, Pareira, V. K. Chatuphale, Devar, P. C. Bapat, G. A. Hardikar, R. L. Jaigamkar, K. R. Alur, S. P. Deshpande, Y. S. Wakankar, G. D. Bhagwat, U. J. Pathan, G. T. Shah, B. M. Phatarphod, V. M. Tambekar, D. T. Parnaik, A. A. Chate, R. M. Kalapesi, K. R. S. Ayer, M. K. Garudacharya, D. B. Khole, K. B. Nair, K. T. Detha, R. R. Joshi, P. Miranda, P. G. Date, and M. R. Tagare.

Mr. M. Mohey-Deen, Principal of the Bombay Veterinary College, attended the meeting at the request of Khan Sahib Dhakmarvala and took part in the deliberations whole-heartedly.

The Hon'ble Mr. Morarji R. Desai, Minister for Revenue, Rural Development and Agriculture, Bombay Government, Bombay, was requested to open the Annual Conference.

On the 16th April at about 4 p.m. the Hon'ble Mr. Morarji R. Desai arrived at the college and was received by Khan Sahib N. D. Dhakmarvala. The members of the Managing Committee of the Association and the members of the Staff of the Bombay Veterinary College were introduced by Khan Sahib to the Hon'ble Minister. After this he was led to the dais and the proceedings began with the following Welcome Address by Khan Sahib Dhakmarvala:—

“HON'BLE MR. MORARJI DESAI AND GENTLEMEN,

As the President of the Bombay Veterinary Medical Association I tender to you all my grateful thanks for your attendance here to-day, especially I thank the Hon'ble Mr. Morarji Desai for the honour he has done to our Association by kindly accepting our invitation to open and preside over to-day's proceedings of the Annual General Meeting of the Association. I need hardly say that we appreciate it very much since amongst his multifarious duties he has found time to come here to-day. The Hon'ble Mr. Desai needs no introduction since he is the Minister for Revenue and Agriculture and we congratulate ourselves for

having him amongst us, and his presence here to-day is a proof of his great sympathy towards the Veterinary profession. I am sorry to say that owing to other conferences in the City, the attendance at our meeting is not so great as expected.

Before reading the Annual Report of the Association it will not be out of place if I were to mention a few salient points of the Association, for the information of the Hon'ble Mr. Desai.

As far as Veterinary Associations are concerned, I am proud to say that Bombay claims to have taken a lead in the matter, as the first Association of its kind was started in 1896, by the late lamented Prof. J. H. Steel, the first Principal of the College. Our Association is an Association of graduates of the Bombay Veterinary College in service, Government or otherwise. A majority of the members is employed in the Civil Veterinary Department of the Presidency Proper and others are in the employment of Local Bodies and allied Societies or as Private Practitioners. The last class of people is fast disappearing on account of the increase in the mechanical transport and consequent gradual extinction of the paying patients, especially horses. The graduates, therefore, have no other field open to them except service, either Government, State, Municipal or private. The private service consists of employment as Veterinary Surgeons in charge of some Pinjrapoles and Gowshalas. A few are employed in Municipalities and in S. P. C. A. Our membership is decreasing every year since a separate Subordinate Service Association of Graduates employed under the C. V. D. is lately created and another in the Baroda State.

The Aims and Objects of our Association are:—(a) To promote the study of professional subjects and diffuse the knowledge thus acquired; (b) To consider the question of common interest affecting Veterinary profession as a whole; (c) To raise the social status of the members of the Association; and (d) To create a feeling of unity and brotherhood.

It is not necessary for me to mention the necessity and usefulness of holding such Annual General Meetings. First of all we have to do so in accordance with the rules and regulations of the Association so that the Annual Report of accounts, etc., may be read and passed. Not only this but the meeting serves a useful purpose in bringing professional brothers together and stimulating interest in discussions on professional subjects and their difficulties and meeting new members and old friends. We are all bound together in the common cause of promoting the interest of our profession by co-operation and in this Association we have an organisation which stands to uphold in every way the dignity and honour of our profession and to provide a sense of *Esprit de corps*, amongst all members.

With these few introductory remarks I now come to the proper business of to-day's Annual Meeting.

In placing before you the Annual Report of the preceding year, it gives me great pleasure to mention that since we met in December, 1936,

at the time of the memorable gathering of the Golden Jubilee Celebration of the College, we held four meetings of the Managing Committee. Our membership is now 144. As regards the financial condition of the Association, it may be stated that the balance is Rs. 1,525, the income being Rs. 551-5-0 and expenditure Rs. 269-12-0.

During the year Rao Bahadur V. R. Phadke, one of our members and Principal of the College, was appointed to act as the Director of Veterinary Services, Bombay Presidency. This was a great honour conferred by Government on a graduate of our college and we congratulate both Mr. Phadke and Government for it. On 7th December, 1937, we received the sad news of the death of Mr. K. Hewlett, at Somerset, England. Mr. Hewlett worked as Principal of the Bombay Veterinary College for nearly twenty-two years and he made many important changes and improvements in the institution. Our Association placed on record their deep regret at his death and sent a letter of condolence to Mrs. Hewlett.

Before asking you to pass the accounts and adopt the Annual Report of the Association, as it is customary for the President to introduce the proceedings with some remarks about Professional matters, it is with great pleasure that I do so as briefly as possible.

Employment of Veterinarians in Public Health.—During the last few years there has been a certain amount of awakening to Public Health Organisations in different parts of the country and a great deal is being done to cater to the health and well-being of the public by means of prophylactic measures in preventing contagious and infectious diseases.

In this connection it may be safely stated that a veterinarian has got to play an important part in this great useful organisation by contributing to the general health of the public especially with regard to the supply of good, clean and wholesome food to the public. Some of the articles of food which are commonly used in this country are meat and milk. Of these milk may be said to be a universal article of food, being rich in vitamins. It is good both for the sick and the healthy. It is used in the form of various preparations and is an ideal food and if the vitality of the people is to be preserved, there should be a generous intake of milk every day. But like all other fresh foods milk is liable to contamination and infection. From its very source right up to the time it reaches the consumer, it is exposed to various risks and, if not properly looked after, becomes a dangerous article of food. Bovine Tuberculosis is said to be communicated to human beings by the use of milk from cows affected with tubercular mammitis. This disease is not easily detected except by a veterinarian who is the only person best fitted for this work. Again it is only he who can advise as to the proper methods of feeding milch cattle to keep them healthy. In a similar way the production of meat from healthy animals is essentially a veterinary service. Meat is used by a certain percentage of people of this country and, like milk, is liable to contamination and a number of diseases are produced by bad and infected meat.

With regard to the other function of a Public Health Organisation, viz., prevention of contagious and infectious diseases, the necessity of co-operation of veterinary service with the medical is very great. Rabies, Glanders and Anthrax of animals are communicable to human beings and therefore the help of a veterinarian is quite essential in this matter. It will thus be seen that the veterinarian has got a definite role to play in Public Health Organisations. But at present this organisation is a close preserve for Medical and Sanitary Officers and the Veterinarian is not thought of to be of much use. This is due to the fact that the Public Health primarily concerns itself with human beings. We, therefore, earnestly appeal to Government to see that no Public Health Organisation should be complete or efficient without a veterinarian in it. We have in the present Ministry the Hon'ble Dr. M. D. Gilder as the Minister of Public Health, and we trust that he will take bold and courageous steps to do all he can in this matter to make the veterinary profession effectively useful to the public. But the veterinary needs for our vast agricultural country are very great and therefore a great responsibility lies also on the Hon'ble Minister, who has the Veterinary Education and Service in his portfolio, to improve the situation in all directions so that a highly trained and an efficient Veterinary Service may be made available to the masses both for prophylactic and curative purposes and for improving and safeguarding the animal husbandry industry.

In my presidential address at the time of the last All-India Veterinary Conference I urged the necessity of "Drink more milk" campaign and the importance of a pure milk supply both to adults and infants. The small yield of milk of the average cow in India is well known. But it is a matter of satisfaction to note that this is now going to be remedied by selective breeding and proper feeding.

In this connection a powerful impetus is given by H. E. Lord Linlithgow, the Viceroy, to the cause of cattle breeding as the result of his gift of pedigreed bulls. This example is followed by others which will lead to the economic welfare of the country. For the same reason a cattle show was lately held at Delhi where a large number of cattle of different breeds from all Provinces had been exhibited and the pure ones were awarded prizes. This is a move in the right direction. Not content with this, H. E. the Marchioness of Linlithgow has taken up the question of organising an Anti-Tuberculosis Fund. We wish her a great success since it is both meet and timely that in harmony with the appeal of Lady Linlithgow there has been launched in Bombay a determined attack on those mercenary persons who control the distribution of milk amongst the people of Bombay. A properly instituted campaign has been started and dealers of adulterated milk are prosecuted and heavily fined. The courts have risen splendidly to the occasion but in certain cases trading licences ought to be cancelled and rigorous imprisonments for such persons would be welcome by the public because the vendors not only defraud the public generally but deprive the helpless invalids and assist in the starvation of babies. Of all the foods so directly connected with the question of Tuberculosis there is none that will take the place of milk. The vital fluid contains about 88 per cent of water and apart

from the other constituents the actual nourishment is given by the fat content which is commonly referred to as cream. All Municipalities should demand that skimmed milk must be designated as such and nursing and invalid milk must contain full cream. There should be a uniform standard laid down for the Inspectors and a legislation is needed for this purpose to grapple with the destroying demon of Tuberculosis.

It is, therefore, imperative that in this pending conflict with the great White Plague the matter of pure milk supply must receive administrative and legislative attention if the gigantic task, to which Lady Linlithgow has addressed herself, is to prove successful. Because it must be remembered that, if this curse is to be lifted and if India is to exorcise Tuberculosis, it will be, by adequate recognition to the national problem of malnutrition, because Tuberculosis can be properly regarded as a deficiency disease.

The First All-India Cattle Show in India held at Delhi this year was a new feature. The Royal Commission on Agriculture in India declared in their report that the condition of the times demanded from Government much more attention to the welfare of the live-stock than was being given to it. Fortunately there is at the helm of the Indian affairs one, whose experience as the Chairman of the Commission appointed 12 years ago, makes him realise the place of the cow in the Indian scheme and who has therefore done his utmost to give an impetus to cattle breeding. The Delhi Cattle Show at which some 25 breeds of cows and buffaloes were exhibited was admirably calculated to further this end. Besides as part of the proposals of the Commission for a Central Council of Agricultural Research, they prescribed the appointment of a special Advisory Officer for Animal Husbandry and a new chapter for the benefit of Indian cattle was opened when Government appointed Sir Arthur Olver to this post. This officer in the course of his surveys of Indian cattle conditions saw the necessity for authoritative definition of breed characteristics and published a monograph on the subject. Cattle breeders will note with interest Sir Olver's opinion that the 21 breeds of cows observed by him may be reduced to five main types, *viz.*, the large white cattle of North, the distinct Mysore type, the highly peculiar Gir cattle of Kathiawar, the small coloured and scattered Hill cattle, and the Dhanni cattle of the Punjab. These investigations have shown that, in a few years, selected milch breeds of pure Indian origin can, by scientific feeding and management combined with systematic breeding control, will be raised to levels of efficiency as high as or higher than those of imported European cattle or their cross breeds.

Animal Nutrition.—When problems of human nutrition in India are receiving the attention of Government there seems to be a lack in doing the same for animal nutrition on the grounds that it was paramount to improve the diet of the people before being concerned with that of animals. But a little consideration will, however, show that the two problems are closely bound up together. India differs from most other countries in that she has an enormous live-stock population competing with her human population for

the existing food supplies and owing to social customs she is not able to convert as much of her live-stock population into food for her human population as other countries do—in other words—dairy products mainly enter into human dietary but even dairy products are subordinated to the need for cattle labour to aid in human husbandry. Animals are to some extent dependent upon the same food resources as their masters, and it is obvious that, when men themselves are struggling to raise sufficient food or commodity crops to support themselves, there is small scope for fodder crops. The majority of animals in India live by grazing on waste land while a minority obtain part of their requirements from the straw and other residues of crops grown for human beings and a smaller number get a proportion of nutritive fodder such as legumes or oil cakes. The lack of nourishment in the average dietary of Indian cattle is responsible for their poor physical condition and poor yield of dairy produce and consequently an inadequate supply of milk has direct bearing on the health of the people. The greatest limiting factor to the increased consumption of milk is the small quantity produced by the average cow. But recent experiments show that cows and buffaloes possess latent milking qualities which respond to proper feeding and better nutrition. It follows therefore that, by the application of scientific principles of breeding and improved methods of feeding, greater quantities of milk and other dairy produce would be available for human use and thus have a good effect on the nutrition of the people.

Research Experiments on Nutrition of Animals.—The Imperial Veterinary Research Institute, Muktesar, is now engaged in carrying out experiments on nutrition. One of these is the mineral feeding experiment with the dairy herd. Blood samples were analysed at different periods to study the effects produced on mineral balance with fodders known to be deficient in lime and phosphorous and the effects of a bone meal supplement in maintaining the calcium and phosphorous content.

Experiments were carried out to determine the mineral requirements for growth of calves and to determine the effect of high protein feeding on milch animals. In the latter experiment no significant variation in the milk yield was noticed.

The problem of abortion, both in cows and mares, has been also studied from the nutritional aspect. In the case of cows evidence has been obtained that mineral deficiencies and abortions are frequently correlated and, in certain herds selected for treatment by enhanced nutrition, a marked amelioration of the incidence of abortion was noted.

Similar attempts to correlate malnutrition with abortion in mares were not so convincing, although in some cases variations in blood calcium were observed.

One of the greatest achievements effected in the advancement of Veterinary Science in India to-day, is the discovery of goat virus as a prophylactic agent against the fell disease rinderpest which causes even to-day immense losses to poor cultivators. On account of this discovery

it is now quite possible to control the spread of rinderpest within a few days. I, therefore, suggest that the Hon'ble Minister may be pleased to take up the question of completely eradicating rinderpest from this Province by arranging, with an extra staff, special campaign against the disease.

The investigation into animal diseases in this country has revealed the presence of Bovine Tuberculosis, John's Disease and Contagious Bovine Abortion, which are the dreaded diseases in cattle breeding and dairy industries. It is necessary in this early stage of the industry to take rigorous action to prevent the spread of these diseases and with that view to making the diagnostic tests for these diseases compulsory in the cattle breeding and dairy institutions. I hope that the Hon'ble Minister will give a favourable consideration to this point.

I further request that the Hon'ble Minister may be pleased to allot sufficient funds for the expansion of the Civil Veterinary Department which is so very necessary to protect the cattle wealth of the poor cultivators from being annihilated by disease.

In December, 1936, the Jubilee Celebration Committee of the Veterinary College had expressed the pious hope that the College would continue to progress and attain its highest position under the ægis of the new constitution and be able to celebrate its centenary. Little did we expect that so soon under the new constitution serious proposals would emanate for the transference of the college to Poona and its amalgamation with the Agricultural College. It seems that this had to be done in the name of economy and retrenchment. The Bombay Veterinary Medical Association have sent an emphatic but respectful protest against this proposal and enumerated several points in favour of the retention of the College in Bombay, and we felt sure that the Hon'ble Mr. Morarji R. Desai—who has presided to-day and who is in charge of our Department—would be the last person to entertain such proposal. We are glad now to announce that the Government have kindly decided to drop the proposals for the removal of the College to Poona and we sincerely thank Government for their wise decision in this matter. We hope that the College will, in future, have a progressive career and that the standard of education be raised to five years' course, affiliating it to the Bombay University. In this connection we wish also to convey our thanks to the Editor of the *Indian Veterinary Journal* for publishing an editorial under the caption "Once Again" in its issue of January, 1938, and sending advance copies of the same to the authorities, all the M. L. C.'s and M. L. A.'s.

Before concluding I wish to convey the thanks of the Association to the Secretaries, Messrs. P. G. Date and J. G. Gokhale, and the Treasurer, Mr. V. N. Kulkarni.

We trust that we will be able to learn a great deal from the deliberations and discussions which will take place during the course of this Annual Meeting. I am sure that we will be able to give you

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an excellent meeting which will not only be of benefit to us from a scientific point of view but also a relaxation from work and an enjoyable holiday.

I have also to thank the Principal, Mr. Mohey-Deen, for allowing us the use of the College building for this meeting.

With these few remarks, I now request the Hon'ble Mr. Morarji Desai kindly to open the proceedings of this meeting."

The following is an extract of the speech of the Hon'ble Revenue Minister Mr. Morarji R. Desai presiding over the 21st Annual Meeting of the Bombay Veterinary Medical Association :—

The Minister speaking in fluent Hindi said that he was extremely thankful to the Association for giving him an opportunity to meet the veterinarians. It was his great desire on the assumption of his office to visit this Institution (where the Annual Meeting of the Bombay Veterinary Medical Association is being held); but owing to pressure of work he was not able to do so earlier.

The Minister added that the Veterinary Medical profession has a great chance to demonstrate the methods of improving cattle breeds and is best equipped for that work. In improving the live-stock both in their draught and milk producing qualities the profession would be bettering the prospects of the peasantry.

There was no doubt that India needed the development of veterinary science, continued the Minister, but he emphasised that Government alone could not do much towards its improvement; in that task the help and co-operation of non-officials was also needed. For instance, he said, even if Government set apart Rs. 1,00,00,000 for cattle breeding, it would not succeed if sincere and genuine workers were not forthcoming to work out the scheme.

American Example.—In America, Mr. Desai said, cows yielded 16 to 20 seers of milk per day. He saw no reason why the milk yielding qualities of Indian cows could not also be improved if attention was paid to that end.

Disease among animals, he observed, would not lessen by the mere swelling of numbers of veterinary surgeons, just as human ailments did not diminish with the increase in numbers in the medical profession. They would have to make sustained efforts to achieve that end.

Any work for improving the breed of cattle should be done on business-like methods, or it would lose much of its benefits, as the peasantry would not take to it. In that connection he cited the example of the Government agricultural demonstration farms, where more often than not the expenses exceeded the income. That was one of the main reasons why Indian agriculturist felt shy in adopting the methods employed in those farms.

Misunderstanding Cleared.—Referring to the transfer of the Veterinary College to Poona, Mr. Desai said there seemed to be some misunderstanding on the question. The proposal had not been made with any idea of economy or retrenchment. Rather, he thought, that there was not much scope for the beneficial use of the veterinary science in the City. Rural surroundings were best suited for the successful work of the College. If he gave up the idea of the transfer, it was due to the fact that there were no funds available for the construction of the college building at Poona. The College would be transferred whenever funds permitted. A majority of the students were drawn from outside the City and the location of the College, therefore, should be decided to suit the convenience of students and for the benefit of the Presidency.

Concluding, the Minister appealed to them to endeavour to improve the live-stock, both in their draught and milk producing qualities, by scientific breeding and thus lend a helping hand to the economic betterment of the peasantry. For, even with the rights having accrued to Indians of running their own governments, they did not possess the power of increasing the wealth or removing the poverty of the masses over-night. He believed that there was only one solution to the problem and that was the attainment of freedom.

Messages from the Hon'ble Dr. M. D. D. Gilder, Minister for Health and Excise, Mr. E. S. Farbrother, Director of Veterinary Services, Mr. P. Srinivasa Rao, Editor, *The Indian Veterinary Journal*, Rao Bahadur V. R. Phadke, Lt.-Col. S. L. Bhatia, I.M.S., Principal, Grant Medical College, Lt.-Col. S. S. Vazifdar, I.M.S., Sir Nowroji Saklatvala, and others were read.

After a vote of thanks to the Hon'ble Minister, he was taken round and shown the College and Lazaretto by Khan Sahib N. D. Dhakmarvala and Mr. Mohey-Deen, Principal, Bombay Veterinary College.

The proceedings of the day terminated with the entertainment of the guests to light refreshments.

The Conference resumed its sittings at 9 a.m. on 17th April 1938. Khan Sahib N. D. Dhakmarvala occupied the Chair.

The following papers were read and discussed :—

- (1) 'Purpura Hæmorrhagica in Equines' by Mr. D. T. Parnaik, G.B.V.C., Reserve Veterinary Assistant Surgeon, Poona City.
- (2) 'Home-Grown Green Meat in the Konkan Tract' by Mr. M. K. Garudacharya, Lecturer, Bombay Veterinary College, Parel.
- (3) 'Hæmoproteus Columbæ in an Indian Peacock' by Messrs. K. R. S. Ayer and M. K. Garudacharya.
- (4) 'Metorrhagia in a Great Dane Bitch' by Messrs. K. R. S. Ayer and J. P. Damri.

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- (5) 'Preservation of Perishable Food Stuff' by Mr. D. S. Laud, Superintendent of Markets.
- (6) 'Fracture of Ribs in a Dog' by Mr. S. P. Deshpande, Veterinary, Assistant Surgeon, Bhamburda.
- (7) 'Retention of Urine in a Bullock' by Mr. S. P. Deshpande, Veterinary Assistant Surgeon, Bhamburda.
- (8) 'Kanta in Fowls' by Mr. M. Mohey-Deen, Principal, Bombay Veterinary College.
- (9) Some Proposals for the Consideration of the Conference by Mr. R. R. Joshi, Retired Deputy Superintendent, H. E. H. the Nizam's Veterinary Services.

The conference was then adjourned to 2-30 p.m.

At 2-30 p.m. when all the members reassembled, the minutes of the last meeting were read, confirmed and signed, and the following resolutions passed :—

1. That the audited statements of accounts be adopted.
2. That the Government of Bombay be requested to introduce four years' course of Diploma Examination in the Bombay Veterinary College immediately.
3. That the Government be requested to reintroduce post-graduate refresher course in the Bombay Veterinary College and the Veterinary Assistant Surgeons be deputed in batches to attend the same with a view to refreshing their scientific knowledge to enable them to carry on the duties entrusted to them most efficiently.
4. That, as we have in goat virus vaccination an efficient weapon of dealing with rinderpest outbreaks, the Government be requested to introduce compulsory vaccination against the disease in the affected areas and to adopt a three years' plan of eradicating the disease from this Province.
5. That the Government be requested to amalgamate the Live-stock Department with the Veterinary Department with a view to carrying out the work connected with animal husbandry, animal health and disease most efficiently in this Province as has been lately done in the Province of Madras.
6. That the Association is of opinion that a small Dairy and Poultry Farm be attached to the Bombay Veterinary College so that Dairying and Poultry Farming may be taught as the subjects in the Veterinary curriculum of this college. (This is a recommendation of Dr. N. C. Wright.)

7. That the Government be requested to create in the cadre of the subordinate Veterinary Staff a selection grade with a pay of Rs. 160 to those who are drawing pay according to the old scale, and with a pay of Rs. 150, to those drawing pay according to the new scale and that 10 per cent of the staff be promoted to that grade.

8. That the Government be requested to recommend to the Local Bodies the appointment of a trained compounder to each Veterinary Dispensary as far as possible to assist the Veterinary Assistant Surgeon to conduct his dispensary quite efficiently.

9. That a publicity bureau be established with the following members for disseminating information regarding the value of Veterinary Profession, and the work done by the Veterinary Department in this Province to the public from time to time :—

Khan Sahib N. D. Dhakmarvala and Mr. D. S. Laud.

10. That a sub-committee consisting of the following members be appointed to examine the proposals suggested by Mr. R. R. Joshi in his paper "Draft of Some Proposals for the Due Consideration of General Meeting of the Bombay Provincial Veterinary Association" and to submit their report to the Managing Committee and, if they are approved, the proposals be circulated to all the members for their opinion, within three months :—

Khan Sahib N. D. Dhakmarvala (Chairman).

Mr. D. S. Laud.

Mr. R. N. Naik.

„ C. N. Desai.

„ K. K. Kandade.

Mr. Joshi be requested to attend the sub-committee meetings.

11. That the Government be requested to appoint principal examiners for all the professional examinations in the Bombay Veterinary College, chosen from amongst veterinarians from any part of India, outside the members of the College Staff, and that the members of the College Staff be appointed as internal examiners in their own subjects in co-operation with external examiners.

12. That the Government of Bombay be requested to allot to the principal examiner only one subject in each professional examination of the Bombay Veterinary College.

13. That the Government of Bombay be requested to award remuneration to the internal examiners also.

14. That the next Annual General Meeting be held in Poona during the Christmas holidays of the year 1938.

15. That the Government of Bombay be requested to add the word "Medicine" after the word "Surgery" in the present Diploma of the Bombay Veterinary College.

16. That a sum of Rs. 25 be donated towards the Anti-Tuberculosis Fund started by Lady Linlithgow in the form of rupee tickets organised by the Mayor of Bombay.

17. That Mr. P. Srinivasa Rao, Editor, The Indian Veterinary Journal, be thanked for the troubles taken by him in writing the Editorial "Once Again" and supplying advance copies of the same for distribution among the M.L.C.'s and M.L.A.'s, free of charge.

18. That the following members be appointed as Office-bearers of the Association for the next year :—

Khan Sahib N. D. Dhakmarvala, President.

Mr. P. G. Date } Joint Secretaries.
„ T. R. Khaladkar }

„ V. N. Kulkarni, Honorary Treasurer.

„ D. S. Laud }
„ C. N. Desai } Members of the Managing Committee.
„ R. G. Sathe }
„ R. N. Naik }
„ K. B. Nair }

19. That Mr. M. Mohey-Deen, Principal, Bombay Veterinary College, be thanked sincerely for placing his quarters at the disposal of the Managing Committee for holding their meetings on all occasions and for his kind hospitality at these meetings.

20. That Mr. M. Mohey-Deen, Principal, Bombay Veterinary College, be thanked for allowing the use of the Old College Hall for holding the Annual Session of the Association and for affording every facility to make the Session a success.

21. That the students and the staff of the College be thanked for the assistance given by them in making the Session a success.

With a vote of thanks to the retiring members of the Managing Committee, the Proceedings terminated.

Copy of the Proposals for the due consideration of the General Meeting of the Bombay Provincial Veterinary Association by Mr. R. R. Joshi, Retired Deputy Superintendent, H. E. H. The Nizam's Veterinary Services, referred to in Resolution 10 of the Proceedings of the Annual General Meeting of the Bombay Veterinary Medical Association, on 17th April, 1938.

The work of the present Veterinary Association, which is done very silently and in an unassuming way, pertains only to literary field. In my humble opinion, the Association should do something more, viz., take up business of some kind for the purpose of improving its financial condition to such an extent as to be capable of starting institutions of public service such as dairying and live-stock breeding. At present the business of dairying and live-stock breeding is being handled by persons, who may not be suited for such work and whose only motive is profiteering. If, however, such business is managed by Veterinary Surgeons, who by their expert knowledge and education attain some degree of efficiency, the conditions of the supply of milk and its products are bound to improve, which without them are far from satisfactory. For the verification of this statement, one has not to go far. One has only to observe carefully how Bombay has been hard put to it in tackling the problem of improving the conditions of the supply of dairy products coming to the City; how in spite of her long struggle for many years, the affairs are at *status quo* and are just where we were, perhaps a trifle better; and how the problem is still unsolved. The main reason of this seems to be the apathy of the rich people to seek the assistance of proper persons, i.e., Veterinary Surgeons, as also their ignorance in conducting their trade on any line other than material profiteering. In the efficient hands of the Veterinary Surgeons the business, while continuing to yield its usual profits, will also afford to the public an opportunity to obtain reliable and good stuff; and they will now be rewarded for the money they spend. To remove the apathy and indifference present in the minds of our affluent brethren, to promote the welfare of our Association, and to make it a self-supporting body, I have a few suggestions to offer. I trust that my learned professional brothers will give to these proposals their full and mature consideration at their General Meeting, enlighten me about their deliberations and give me opportunities of serving them and their interests better.

The Proposals.

1. To start with a company of two or more Veterinary Surgeons be formed. I undertake to form the same.
2. The company should take up certain agencies of well-established Life Assurance Companies. Every Veterinary Surgeon desiring to insure his own life should insure through this agency, as also he should introduce his relatives, friends, etc., here.
3. After defraying the expenses, the company should surrender 50 per cent of the net profits to the Association which should forthwith start dairying and live-stock breeding. This field of activity

will enlarge as the capital increases. The increase in the activity will naturally lead to the employment of the unemployed Veterinary Surgeons.

4. The Bombay Provincial Veterinary Association be requested to issue circulars advising all the Members to promote this scheme and thereby to promote the welfare of the Association.

College News.

BOMBAY VETERINARY COLLEGE.

Results of the Final Year Examination held in April 1938.

THIRD (DIPLOMA) PROFESSIONAL.

- | | |
|---------------------|----------------------|
| 1. Detha, K. T. | 7. Hegdekatti, V. M. |
| 2. Gulhane, B. M. | 8. Zargar, S. L. |
| 3. Dube, J. N. | 6. Phanse, B. R. |
| 4. Joshi, H. B. | 10. Patil, R. S. |
| 5. Mohomed Sumar. | 11. Sangli, B. N. |
| 6. Shindikar, B. R. | 12. Nadgir, S. R. |

MADRAS VETERINARY COLLEGE.

The following Veterinary Assistant Surgeons have been selected for P. G. course in the Madras Veterinary College during the year 1938-39:—

- | | |
|---------------------------------|-----------------------|
| 1. Mr. R. Kuppanna Iyengar | } Madras. |
| 2. " V. Parameswara Menon | |
| 3. " K. R. Lakshminarayana Iyer | |
| 4. " K. Achanna Shetty | |
| 5. " B. Ramayya | |
| 6. " H. R. Rangaswamy | |
| 7. " B. V. Kulkarni, | } Hyderabad (Deccan). |
| 8. " Hazrat Shah Khan. | |

ADMISSIONS TO THE COLLEGE IN 1938.

Forty students from the Madras Presidency—25 from the Madras and 15 from the Bezwada centres—have been selected for admission; and, in addition, 10 students from outside the Presidency from the States of Mysore, Kashmir, Cochin and Travancore have been selected.

Communication.

To

THE EDITOR,

"THE INDIAN VETERINARY JOURNAL,"

MADRAS,

SIR,

Please publish the following article in the ensuing issue of your *Journal*.

I remain,

Yours sincerely,

JOHORE,

May 31, 1938.

(Sd.) M. V. PILLAI, G.B.V.C.,

Late Assistant Veterinary Surgeon, Penang.

THE RESPONSIBILITIES OF THE PRESENT MINISTERS ON MEAT INSPECTION IN INDIA.

As a result of a strenuous and prolonged agitation, suffering and sacrifice for the past twenty years or more, the Congress, the only powerful political organisation in India, has come into power in the majority of the Indian provinces. The whole world is watching with keen interest as to what the result of administration of the Congress Ministers will be. The fact that they are now engaged in tackling serious problems such as public health, education, prohibition, debt relief and village reconstruction with a view to improving the condition of the people, particularly the masses, is really a great blessing.

It is an undisputed fact that the welfare and prosperity of the people and power of the State depend upon the measure of public health that a country possesses. It is regretful to find that, of all the various public-health activities that are being chalked out recently by the ministers, "Meat Inspection" has not been given any attention or importance.

The purpose of this article, therefore, is to draw the attention of the authorities now in command that public-health reform of any shape or form is absolutely incomplete without a systematic meat inspection. In highly civilised countries as in America and in Europe, where meat forms an important article of food, the advantages of a scientific meat inspection have been fully recognised and the method of working has reached a very high standard, with the result that there is no town in these countries without well-equipped abattoirs. They have also realised that a fully qualified veterinary surgeon is the man fit to control, manage and supervise its working. The English Departmental Committee on meat inspection and other well-known authorities have recommended that the actual work of meat inspection should be carried out

by veterinarians. Even in Malaya, a country lying close to India, the standard of meat inspection is much higher than in any other eastern country and the control is in the hands of the Veterinary Department.

Let us now for a moment examine the system that is existing in India. In one word I can put it that meat inspection is a laughing stock and a national disgrace. It is most imperfect, shamefully unsatisfactory and unscientific except perhaps in a few big cities. The country is studded with unlicensed, unhygienic, ill-kept and badly managed slaughter houses practically under nobody's control and with no facility for a proper examination. Uniformity of rules and regulations are conspicuous by their absence. The usefulness of veterinary surgeons as meat inspectors is unknown and unheard of. The appointment of meat inspectors depends upon the whims and fancies of the chairmen of the municipalities and panchayats. In some places sanitary inspectors, and in others junior medical officers are engaged in carrying out the work. It may be due to want of apathy, gross ignorance, lack of funds and absolute loss of consciousness among the authorities that this important part of public-health work has been so neglected. All the above facts go to prove that meat inspection in Indian towns is defective and disappointing. Since meat-eating people are gradually increasing it is the duty of the Government to see that the health of such people is sufficiently safeguarded.

Meat is a perishable article. Animals intended for meat are subject to many diseases—parasitic and microbic—that can easily be communicated to human beings. It necessarily follows that, in the interest of the public health, the man responsible for such work should have a wide knowledge of diseases of different food animals, their anatomy, physiology and pathology. Being a highly technical work, the man best suited and competent is one who has studied this science in a recognised college—a veterinary surgeon—and not a sanitary inspector or a conservancy overseer. It is impossible to run a slaughter house efficiently and scientifically without the introduction of suitable regulations framed by the authorities concerned. It is, therefore, left to the Hon'ble Ministers of Indian provinces to take immediate steps for the appointment of an expert committee consisting of health officers, veterinary surgeons, municipal presidents and lawyers, and enquire into the possibilities of improvements and advise them on the following basis:

1. It is necessary that all food animals should be examined before slaughter (Ante-Mortem) to see if they are showing any signs of disease which would affect the flesh. Any animal showing a rise of temperature before slaughter should be prohibited from being killed. This work is so important that it cannot be entrusted to anybody except to a veterinary surgeon.

2. Standard type of abattoirs should be constructed in all the towns in suitable localities. Provision should be made to have a plentiful supply of water for cleaning and washing. Concrete floors and walls without cracks and holes are more preferable. Special rooms should be

set apart for killing animals, for collecting bones, hides and horns, and for keeping partially or wholly condemned carcasses and organs under safe custody before they are disposed of.

3. Enactment of necessary legislations and administrative measures are to be enforced to check the growth of unlicensed and private slaughter houses, management of meat markets, and to prevent the indiscriminate sale of meat in towns not prepared at a public slaughter house.

4. Every big slaughter house must have a lairage attached to rest the animals coming for slaughter and to keep them under observation.

5. Suitable by-laws with regard to the time of slaughter, sanitation of the surroundings and cleanliness of the workmen and their dress should be made to facilitate the management of the abattoirs.

Mere laws and regulations passed by the authorities and printed in books will be of no use, unless they are rigidly followed and strictly enforced.

A properly conducted and efficiently managed slaughter house and meat market will not only safeguard public, but will also be sources of revenue to the municipalities.

"If there is a will there is a way."

Extracts.

VETERINARY TEACHING IN INDIA.

India, said a Press Note the other day, has over 300,000,000 domestic animals, nearly double the number in the United States, and its animal products are estimated to be worth Rs. 2,000 crores annually. Domestic animals mean a great deal to the land, probably more than the cash crops, the note suggested, but those, who are employed to give them expert attention and so help the peasant to get the best value out of them, are a very small army. How many are conscious of the veterinary worker, either as a scientist or as a social being? Yet his is a task of supreme importance in India. The public ought to know more about him.

We suppose *The Indian Veterinary Journal* is written mainly for veterinary workers, and does not aim to catch the eye of the general public. The professional standing and professional equipment of India's workers in this field are nevertheless of public importance. A recent proposal on which the *Journal* comments has excited controversy that is not only of technical or professional interest. We hear much at times of the need for vocational or professional education

but how many men out of every hundred, who speak in public about this, show awareness that India has in its few veterinary colleges a good example of vocational education, that is, of education for one specific kind of service to the community? The present controversy turns on a recommendation to the Government of India from the Animal Husbandry Wing meeting at Madras that a central veterinary college should be established at Izatnagar in the United Provinces, to provide for higher veterinary education. That has not unnaturally evoked strong comment from many who are or have been connected with the training of veterinary workers in India. All want the same thing; that is, all want to see India equipped to give the best education in veterinary science that can be given. But should this be done, critics are asking, through a central college that at great cost will send out ten men a year, most of whom may be at once snapped up by the Army? Years of good work have been put into the existing colleges, which have done good service despite handicaps; some of them have by their own efforts developed high teaching standards; why should they be ignored and stinted of help (for that is what expenditure on an expensive central college for all India will mean) and their students be relegated to what official and social opinion will consider an inferior status? We notice that the scheme was unanimously condemned by the All-India Veterinary Conference that met at Bombay not long ago. We notice also that one of the *Indian Veterinary Journal's* editorials candidly comments that "the general feeling of the rank and file was that the originators of the scheme are obviously trying to find employment for some Europeans who are to be paid highly in a service where the European element is getting extinct". From this it may be inferred that the discussion has not been kept steadily at a high level above racial suspicion and recrimination. The important questions are whether the establishment of a central college of this kind and at this cost will be justified by what it does to promote the peasant's welfare, and whether if it comes into existence the existing colleges need be checked in their development and their students deprived of hope to find their way into the most responsible duties in their calling.

Here, we gather, many would point out that the scheme has its origin in the sluggishness of Provincial Governments which have been content with a low level of accomplishment in their own colleges. This statement, we learn from *the Journal*, would not be quite correct. Madras has been ready to find money for improvement but has not been encouraged to by expert advisers. Lahore has a college where for some time a four years' course was given in Urdu, and is now given in English. Madras has a college affiliated to the University where a four years' course is given in English. Those two institutions lead in India, and are not far from the five years' training that seems to be generally regarded as the desideratum. These are matters about which only experts can evaluate many of the arguments. A man need not however be an expert to know that India's needs will not be met by an influx into the ranks of ten men a year with the highest qualifications. Nor, though money is ordinarily hard to come by in India, is it inevitable that the growth of existing colleges should be checked if a small all-India institution comes into being. Those colleges have been starved for

years. Bengal, which more than any other province requires skilled help in the improvement of its live-stock, lags prominently behind Lahore and Madras. It is of public interest that the provinces should not be discouraged or prevented from improving their own training institutions by the diversion of resources to other purposes. Ten more men a year, however highly trained and however strenuous in their activities, will not go far among India's 300,000,000 domestic animals.

—*The Statesman*, Thursday, May 19, 1938.

THE PROBLEM OF RURAL RECONSTRUCTION.

Some Practical Suggestions by "Candidus".

It is estimated that there are three hundred million heads of cattle in India, yielding animal products worth over rupees two thousand crores, scattered in seven hundred thousand villages, spreading from one end of India to the other.

We must realise, however, that the handful of Veterinary Colleges located in a few centres of India and turning out a limited number of graduates, many of whom are taken up by the Army, are sadly insufficient and hopelessly out of proportion to cope successfully with the grave situation that inevitably arises from cattle diseases and other forms of pestilence, which spreading like wild fire, periodically sweep over the country, destroying valuable domestic animals, rendering the poor villagers helpless and depriving them of their scanty heads of cattle which form their only and entire wealth.

Increase Veterinary Colleges.

In Sind, for instance, a Province predominantly dependent upon agricultural and pastoral activities as its main industry, it is woeful that it should not be able to boast of a single Veterinary College, whereas there are numberless Arts and Law Colleges turning out their yearly quota of graduates, a large percentage of whom only adds to the army of the educated unemployed. It is just this overstressed bias in favour of academic studies that tends to increase the unemployment problem. If more attention were given to the training of the younger generation in some sort of vocation such as Agricultural or Veterinary science, it would go a long way to assist in the successful handling of this age-old and harassing problem.

It is of the utmost importance, therefore, that Veterinary Colleges were multiplied, and each province made self-sufficient in this important branch of education.

Sanitation and Hygiene.

Rural Sanitation and Hygiene is yet another factor which should be one of the foremost planks in any scheme of reconstruction which may be envisaged by the Government. One must regretfully admit that

sanitation, as it is understood in its proper significance, does not exist in most of the villages. The vast majority of villages have no systematic arrangements for latrines or removal of sullage. More often than not, they visit outlying fields for calls of nature, with the result that flies and mosquitoes breed abundantly and carry the infection from the dung-hill to the dwellings of the villagers and spread diseases which in their turn take a very heavy yearly toll of human lives. It has been recognised that "National Ill-Health Is a National Loss"; and since this type of ill-health can be easily averted, it is desirable that action should be taken for provision of a series of community latrines, each with a septic tank. The expense is here justified by the saving in human health. I believe in a number of places in Travancore the bore-hole type of latrines have been introduced. This is not so costly and, provided it is attended to at proper intervals, equally effective. Perhaps the simplest method would be the provision of a large concrete slab outside the village, where can be deposited every day all the surrounding refuse. This will prevent the breeding of flies, as flies only breed by depositing their larvæ in the earth. If left exposed, an excellent manure is the result.

* * * *

Grouping of Villages.

The best method, as a preliminary step, would be to group together five or six villages or more if that were practicable, and appoint to each group an agricultural demonstrator with his own area for cultivation, a medical practitioner and a Veterinary graduate, each fully equipped with an emergency dispensary—one to teach and introduce modern methods of agriculture and the use of the very best type of seeds of which he must have an abundant stock at hand, the second to tend to the health of the poor villagers, and the third to teach the care-taking of cattle and precautionary measures against the ravages of cattle disease and other pestilence.

I await with interest the views of the various Departments concerned for the enlightenment of the public through the medium of the *Daily Gazette*.

—*The Daily Gazette*, June 11, 1938.

INDIA'S WEALTH IN LIVE-STOCK AND SIND MINISTRY'S ADMINISTRATIVE POVERTY.

Yesterday we published a special article from the thought-provoking pen of "Candidus" suggesting a few constructive lines on which the work of village uplift should be promoted throughout India. Our writer points out that the yield to the nation from its animal wealth amounts to about 2,000 crores of rupees a year. Looking to this colossal figure, the amount spent by the Government for the conservation and development of the animal wealth of the country is too exiguous for words.

We can give no other explanation for such a negative policy save that animal husbandry does not bring direct taxes to the exchequer, and so there is no direct incentive to the Government to trouble itself with this aspect of national economy. Whatever the explanation, there is no excuse for such a short-sighted policy. The contentment and prosperity of the people should be the primary concern of Government if only for reasons of enlightened self-interest. And in the animal wealth of India there lies every possibility of raising the nation's standard of living to a decent level.

A veterinary research centre has been started at Izatnagar. Lord Linlithgow's personal interest in the improvement of the quality of our live-stock has had a beneficial influence. The Delhi Cattle Show at the Irwin Amphitheatre, which bids fair to become annual feature in conjunction with the Horse Show, should also help to "breed up" our live-stock. But the main charge of neglect of animal husbandry by Government which "Candidus" has made in these columns is borne out by the paucity of veterinary officers and schools.

The figure of 2,000 crores of rupees cited by "Candidus" is not the total of wealth annually produced by our 30 crores of cattle. It is the total of our annual yield of animal products, including sheep, goats, poultry and bees. And it cannot but be so, since owing to the Government's neglect and the desperately poor condition of the peasantry, cattle breeding is done in the most haphazard fashion with the breeding stock—good, indifferent or bad—which the impoverished breeder finds at hand. The result is a "breeding down" of our cattle; so much so, that millions of heads of cattle accounted for in the census figures are not only non-productive and useless, but a drag on the land. Their only contribution to national economy is to fall an easy prey to epidemics owing to the poverty of their physical condition, and thus help to spread the ravages of cattle disease.

As "Candidus" remarks, the heavy academic bias in our educational system is certainly one of the reasons for the neglect of agriculture and Veterinary science as vocational pursuits. But it is also true that Government's niggardly provision for the Veterinary department, and the small prospects thereby left for the Veterinary Surgeon, are additional reasons why boys keep away from this branch of studies. All the departmental plums in the Remount and Veterinary Departments go to M.R.C.V.S.'s from England. Our lads have to be content with a pittance for arduous work in rural areas. There is need for a courageous, far-sighted and generous Government policy for improving the condition and breed of our cattle.

"Candidus" has shown the part which a healthy live-stock contributes to the scheme of rural economy. The Sind Government evidently recognise this, and they have recently issued an advertisement calling for applications for the post of Live-stock Officer in Sind. But they only want B.Ag.'s and B.Sc.'s to apply. They have no use for Veterinary expert! How any man can efficiently perform the functions of

a Live-stock Officer without a sound knowledge of Veterinary science, passes all human understanding. Perhaps the Sind Government know the art of playing Hamlet without the Prince of Denmark. The way in which important posts have been filled by the Ministry during recent months amounts to a mockery of Provincial Autonomy. On what grounds of commonsense or fair play two high Officials of Public Works Department were superseded in favour of a junior is a holy secret which still remains locked up in the breasts of our Ministers. Nor do the Bombay-Sind Public Services Commission show a greater regard for principles in discharging their duties.

Heaven only knows when the administration of Sind will be conducted on regular and normal lines. For the present, the majority of people feel like the correspondent who writes to us: "In this God-forsaken province of ours, things are done *exactly* in the wrong way." The word we have italicised exactly sums up the situation.

— The Daily Gazette, Karachi, June 12, 1938.

MILK SUPPLY IN MADRAS.

LOW PER CAPITA CONSUMPTION.

Marketing Survey Results.

The value of milk as a food for the maintenance of satisfactory growth and health of man cannot be exaggerated. The total output of milk in the Madras Presidency is exceptionally low, being 3,800 million lb. (valued at Rs. 237 millions), consisting of 1,835 million lb. of cow's milk, 1,855 million lb. of buffalo milk and 110 million lb. of goat milk. The milk production in Madras constitutes only 63 per cent of the total output of milk in India which is estimated at 60,000 million lb.

The inadequate supply of milk cannot, however, be attributed to a shortage in the number of cows, as, on the contrary, the live-stock figures point to an over-stocking of cattle, including cows. The number of cows and she-buffaloes was, according to the latest census (1934-35), 4.28 and 2.4 millions respectively. On human population basis, this means that there are for every 100 persons 14 cows (buffaloes included) as against 8 in England. Though they are numerically strong, the Madras cows constitute a poor lot as milkers. The annual milk yield of a cow and a buffalo is found to be 425 lb. and 775 lb. respectively (average 600 lb.) whereas, in England, a cow averages 5,000 lb. The milk production of a district or a particular area is governed by the number of she-buffaloes maintained therein, since a buffalo usually gives twice as much milk as a cow. There is also extreme variation in the milk yield of individual breeds of cow. For instance, while an Ongole cow produces on an average 8 lb. of milk a day, nothing more than 1½ lb. can be expected from a West Coast or Tanjore cow. The largest milk producing district is Guntur which accounts for 303 million lb. or 8 per cent of the total production. Nellore comes easily th

second with its output of 249 million lb. Generally, there is maximum production in December to March in all the districts due to the greater calving of cows in October to November.

About one-half of the output of milk of the province is retained by the producers for conversion into milk products, such as ghee and curd, and the other half is sold as fluid milk. Of the latter $12\frac{1}{2}$ per cent (or $6\frac{1}{2}$ per cent of the total output) is converted into milk products by the purchasers. The balance of fluid milk available for consumption, therefore, amounts to 166 $2\frac{1}{2}$ million lb. or $43\frac{1}{2}$ per cent of the total production.

Imports of Milk Products

The Presidency also imports a small amount of condensed milk and milk powder. The average annual imports of these during the five years ended with 1934-35 amounted to 18,051 cwts. valued at Rs. 12 lakhs, the chief supplying countries being the United Kingdom (56 per cent), Denmark (27 per cent) and Netherlands (14 per cent). As regards milk powder, the United Kingdom is the main source of supply and accounted for 97 per cent of the imports of the province in 1934-35. The supply of condensed milk reaches the peak in December to February and the lowest level in May to July. This indicates a storage of larger stock in winter for distribution in summer. In case of milk powder the supply is more or less uniform as there is no fear of getting spoiled in summer, being in the form of dry powder. About fifteen per cent of the milk products is re-exported to the neighbouring States of Hyderabad, Mysore and Travancore. The net imports in terms of fluid milk, therefore, amount to 17.18 million lb. taking 1 lb. of condensed milk or milk powder as equal to 10 lb. of fluid milk.

Net Supply.

The net available supply of fluid milk for consumption works out to 1,680 million lb. or 1.6 oz. per head daily for a population of 47 millions. A comparison of our figure with that of England with her consumption of 10 oz. per capita vividly illustrates how inadequate our supply of milk is. It is also interesting to note that, not satisfied with the present rate of consumption, the authorities in the United Kingdom have launched a "Drink More Milk" campaign. Owing to a regular flow of milk from villages to urban areas the consumption in towns is slightly better in our province amounting to 2.5 oz. per capita while the village consumption is only 1.4 oz. Among the towns Coimbatore ranks first in the rate of milk consumption being 3.4 oz., followed by Pollachi (3.1 oz.). Next in order are Madura (3 oz.), Madras (2.8 oz.) and Cuddalore (2.3 oz.).

Buffalo milk is in great demand for conversion into milk products, as it contains 7 per cent of butter fat as against 4 per cent of cow's milk. Preference is always for cow's milk where fluid milk is consumed as such. Goat milk has some medicinal value attached to it and it is usually preferred for feeding children and invalids.

Price.

The price of milk in the same year does not fluctuate so often as the other commodities. The highly perishable nature of milk leads to the necessity of finding a speedy sale on the part of the producers and this has the effect of keeping the price level fairly uniform. In urban areas, where the trade is better organised than in villages, milk fetches an enhanced price, and consequently the proximity to a town is a great impetus to the producers. The wholesale price of milk in most urban areas showed a decline of about 40 per cent from 1931 to 1935, and prices have been steady thereafter. The price of cow's milk supplied to the General Hospital, Madras, was 2.3 annas per lb. in 1930-31 and 1.5 annas in 1933-34 and 1934-35. The rate at which Bellary Hospital got its supply was 1.4 annas per lb. in 1932-33 and 0.75 annas in 1935-36. The price now prevailing in Madras is 6 annas a measure or $1\frac{1}{2}$ annas per lb. The price often varies according to the type of milk; cow's milk is dear at most places and cheap at few centres while both cow and buffalo milk is sold at the same rate at some other places. In Malabar buffalo milk is costly in both urban and rural areas on account of the shortage of she-buffaloes. For example, the price variation in different types of milk at Tirur, a small town in South Malabar, is 2 annas, 1.7 annas and 1.3 annas an lb. for the milk of cow, buffalo and goat respectively. The price of milk in many places also varies according to the degree of adulteration.

Usually the producers' and the consumers' price is identical since the bulk of the fluid milk is retained by the producers themselves. Where milk passes through intermediary agencies, the producer secures about 75 per cent of the consumers' price.

Unsatisfactory Quality.

The quality of milk offered for sale is anything but satisfactory. Ordinarily, the producers do not strain the milk, nor do they observe hygienic principles of cleanliness in the production and handling of milk. Adulteration of milk is a general practice followed throughout the Presidency. The extent may be gauged from the fact that in 67 per cent of the milk samples taken in the municipalities where Food Adulteration Act is enforced, water was found to be added to a variable extent, ranging from $7\frac{1}{2}$ to 75 per cent.

Adulteration of milk is so common that a consumer gets no satisfaction unless milking is done in his presence. It is, therefore, a common practice in most towns to have the cows taken from door to door for the purpose of milking though buffaloes do not readily submit to this treatment. One serious defect of this system is the fact that when milk is drawn from a cow in three or four instalments in order to supply the requirements of different buyers, the first man gets the poorest and the last man the richest part of the milk. It has been found on analysis that the first strippings of milk contain only about 1 per cent of butter fat while the last portions show as much as 10 per cent.

Transport.

The main movement of milk is directed from rural to the urban areas within a distance of 2 to 6 miles though, in the case of large towns,

supplies arrive from a radius of even 25 miles. The City of Madras draws a daily supply of about 8,000 lb. mostly by rail. Estimated roughly, the rural quota to Coimbatore and Trichinopoly towns is 5,000 and 4,000 lb. per day respectively.

Over short distances milk is conveyed as headloads in pots uncovered or covered with straw, leaf or cloth. Milk when transported by train is filled in brass pots of 20 to 40 lb. capacity with their mouths plugged with a thick pad of straw. Usually, the mouth of the vessel is too narrow to permit of proper cleaning.

Tricks of the Trade.

As regards the transaction in milk trade, it is very striking that, unlike in other trades, milkmen sometimes pay advance to coffee shops in order to secure a regular sale of their milk. The amount advanced varies from Rs. 25 to Rs. 150 according to the quality of milk to be sold. This practice often leads to unhappy consequences. There is neither an entry in the payee's book nor a receipt given to the payer. The milkmen make it a point to supply only adulterated milk and the shopkeepers have either to tolerate this or to return the advance. There are instances in which the shopkeepers closed their business and disshops are even opened with the money received from a number of milkmen. Where the transaction is carried in good faith, rather a rare happening, money is repaid in instalments without interest within a period of one or two years.

The Neglected Cow.

In our province the improvement of cows from the standpoint of milk yield has not so far received adequate attention; concentration has been much more on the breeding of work cattle, cattle labour being an important item in agricultural operation. The system of breeding cattle adopted by ryots has much to do with the low return from cows. The cow is simply looked upon by the cultivator as the mother of his bullock and she generally gets the remnants of straw from the manglers of keeps for milk purposes. It is right that he looks after his buffalo well, but there is no reason why he should neglect his cow. The majority of milch cattle are seriously underfed as is apparent from the slow rate of growth, the late maturity and the long dry periods of cattle kept under village conditions. Proper feeding no less than breeding can only bring about an improvement of cows, and consequently growing of fodder crops seems to be quite essential in view of the fact that the growth of population has led to an extension of cultivation, and grazing is becoming increasingly difficult. Mixed farming including the rearing of dairy stock offers a bright prospect for increased output of milk.

Milk from Goats.

Goat keeping for the purpose of milk production merits more careful attention. Although at present goats contribute only a small percentage (3 per cent) of the total output of milk, poor people, who cannot

afford to keep cows, can easily maintain a few goats. Many persons are under the impression that goat milk has an undesirable flavour. If the animals are kept healthy and clean, there is no cause for trouble on this score. Goat milk is nutritious and easily digestible.

Suggestions for Reform.

The use of skim milk as a food has to be encouraged wherever it is available. During certain seasons it is found wasted in places like Coimbatore, Trichinopoly, etc. Skin milk contains protein, sugar and minerals in a higher percentage and these constituents make it a fine food.

As regards adulteration of milk, legislation exists, but the checking is not done effectively. Drawing of more samples and extension of the Food Adulteration Act to all the important centres are essential. A deterrent punishment seems to be desirable to reduce the offence. Small fines that are commonly imposed are not having any desired effect.

In order to give free grazing facilities for cows in the Madras City during the dry period and prevent undue slaughter of good cows, special reduced rates for movements of cows from Madras to the Guntur district and back have recently been given at the instance of the marketing section.

The organisation of milk producers in villages to pool the milk and assemble it under hygienic and sanitary conditions for delivery to urban areas is a profitable line of improvement that can immediately be undertaken. In centres where milkmen are already operating they can be organised and educated about sanitary methods of milk marketing and arrangements made for proper testing and delivery of supplies through a controlled and distributed system of milk depots.

The following are the results of a marketing survey of the cattle in the Madras Presidency:—

As per census figures of 1934-35, the total number of bovine animals, comprising oxen and buffaloes in the Madras Presidency was 24'61 millions, the corresponding figure for the whole of India being 230 millions. Amongst the provinces, the United Provinces has the largest number of bovine animals, namely 32'47 millions, Bengal comes next with 25'29 millions, and Madras occupies the third place (24'61 millions), followed by Bihar and Orissa (21'31 millions), Punjab (14'84 millions), Central Provinces and Berar (13'84 millions) and Bombay (12'60 millions). In Madras, about 28 per cent of the cattle are buffaloes and 72 per cent oxen.

The following shows the proportion of cattle population in some of the foreign countries, as compared to that of India which is taken as 100:

India ...	...	...	...	...	100
United States of America	...	...	...	...	29
Argentina	...	...	...	...	13
Germany	...	...	...	...	9

Soviet Russia	...	...	...	...	25
France	...	...	...	...	7
Australia	...	...	...	...	6
Canada	...	...	...	...	4
Great Britain and Northern Ireland	...	...	...	...	4
New Zealand	...	...	...	...	2
Netherlands	...	...	...	...	1

While our cattle population is numerically strong, they are very poor specimens of the bovine species in the whole world. They are, as a rule, weak and puny and inefficient for agricultural work and for milk production.

The cattle population of the Madras Presidency remained almost stationary at about 22 million head of cattle during the decade 1920-30 while an increase of 9.6 per cent was noticeable in 1934-35 as compared to the previous census in 1929-30. The increase was the natural outcome of excess of births over deaths while the uniformity in the number of stock in previous year was attributable to heavy mortality as a result of the outbreak of cattle diseases thereby counter balancing the increase due to births.

The cattle population of the presidency may be regarded as in excess of our demand at present, provided they are efficient. The draught animals intended mainly for agricultural operations number about 4.35 million pairs and the land cultivated comes to 7.5 acres per pair as against 10 acres in 1920.

The number of milch stock is 6.68 millions, comprising of 4.28 million cows and 2.40 million she-buffaloes. On the basis of population there is one milk animal for every 7 persons as compared to one for every fourteen persons for England. In spite of this, our *Per Capita* milk supply is low.

Imports.

All the districts except the West Coast and deltaic tracts are practically self-supporting so far as light draught animals are concerned. But the presidency draws a regular supply especially of superior draught cattle from Mysore, Bengal, Hyderabad and Central Provinces, the annual imports amounting to 80,000 head, of which 57,000 are accounted by Mysore, while 10,000 male buffaloes of "Kimmidi" breed are imported from Bengal.

Exports.

The export of cattle from the province is negligible as the number rarely exceeds 5,000 per annum. Prior to 1922 Ongole cattle used to be exported to foreign countries such as Brazil, Java, etc. As it was then feared that the breed would in course of time be depleted of its fine animals the Madras Government in 1922 passed orders prohibiting the export of cattle of Ongole breed. Subsequently in 1930 an amendment was issued permitting Ongole bulls and bullocks (but not the female

stock) to be exported under licence granted by the Director of Agriculture, but there has been no improvement in the exports since then. The high prices used to be offered by the foreign buyers acted as a great stimulant to the cattle breeders in Ongole tract, and with the loss of such foreign markets the enthusiasm of the producers also waned.

Prices.

Prices of cattle, it is noticed, not only failed to improve after the depression years but continued to decline till 1935, the low level of which has been maintaining itself ever since without perceptible fluctuations. The low prices of cattle now ruling have cut out the chances of cattle breeding as a paying proposition. A pair of work cattle which sold for Rs. 300 in pre-depression period (1928-29) can hardly get Rs. 200 at present.

Marketing.

The existence of a network of annual fairs and weekly shandies is an outstanding feature of cattle marketing in this province. Nearly a million cattle comprising mainly superior work bullocks are assembled and distributed in fairs which number about 60. The weekly cattle markets of which there are over 200 in the province roughly account for the sale of 2½ million animals per annum. These latter deal mostly in poor type of animals as compared to the fine cattle that pass through annual fairs. The draft breeds of Kangayams and the Mysore, are the chief attraction of the markets in southern districts of the Presidency. The cattle traders of the province frequently visit Mysore in order to purchase the Mysore breed and assemble them in the Presidency fairs. The sales are effected through the medium of brokers after a good deal of higgling and bargaining. The numbers of brokers in recent years has grown to such an extent that in some markets, it has been found necessary to license them. The brokerage charged on an animal ranges from 8 annas to Rs. 2, according to the ability of the broker.

Transport.

The movements of cattle take place mainly by road, the traffic by rail being negligible as the facilities offered do not appear to be adequate. The iron wagons, high freight and lack of watering and feeding arrangements are some of the drawbacks. About 10,000 young bulls annually move by road from Ongole area (Guntur, Nellore and Kistna districts) to the Ceded Districts. From the same tract an equal number of milch cows and buffaloes go by rail to Madras City. The majority of these cows when they become dry used to be slaughtered in Madras but now, due to the efforts of the Marketing Board, a substantial reduction in freight on the transport of dry cows has been obtained with the result that most of the dry cows now return from the City to their original home for their further breeding and re-export to Madras.

Suggestions for Improvement.

The marketing arrangements to be effective need a thorough overhauling of the existing systems and the substitution of organized cattle

markets. The introduction of auction sale of cattle at least in a few important cattle markets would be a right step in the direction of improving the sale. The provision of sufficient and separate accommodation for cattle with sheds for different types of animals, together with feeding and watering facilities, are quite essential at the existing markets. At present hardly one-tenth of the market fees is spent in providing facilities for the markets. A properly arranged system of grading of animals according to age and type would go a long way in the marketing improvement.

Side by side with these improvements substantial changes in the existing management of cattle have to be introduced to prevent not only the further deterioration in the quality of cattle but to effect a general improvement of live-stock. What is more important at present is raising the standard of quality rather than increasing the number. A planned distribution of pedigree bulls to suit the needs of different localities and different breeds of animals requires immediate attention. Castration of all useless bulls is another direction in which improvement could be effected. This ought to be supplemented by greater care of animals and proper feeding. Raising of fodder crops preparation of silage wherever facilities exist and the cutting and storage of hill grass might be adopted. Better management of grazing areas is desirable, and cheaper facilities now being given by Government should be fully availed of. The improvement of cattle by breeding offers greater scope with the indigenous breeds than by recourse to cross-breeding. For improvement of milch stock, dry cows and cows in calf should receive greater attention than at present.

—The Hindu June 20, 1938.

PHILANTHROPY AND THE RYOT.

BOMBAY DONORS' EXAMPLE.

Fifteen lakhs of rupees for Research Institutes.

It is understood that two institutes, one for imparting education in animal husbandry, dairying and agriculture, and another for giving instruction in animal genetics and nutrition, are to be shortly started in Gujarat under the auspices of the Government of Bombay.

The two institutes will be the first of their kind in the country, though there is a proposal to start a similar institution somewhere near Delhi under the aegis of Lord Linlithgow.

Another institution for imparting education is also to be brought into existence and the necessary amount has already been collected. This will mainly devote itself to encouragement of Sanskrit and research work.

The Hon. Mr. K. M. Munshi, Minister for Law and Order, Government of Bombay, has been mainly responsible for developing all the three schemes and collecting necessary funds.

Mrs. Irwanti Mansukhlal, wife of the late Mr. Mansukhlal Chhaganlal, who left nearly twenty lakhs of rupees to charities, has consented to give nine lakhs of rupees for the opening of the Seth Mansukhlal Chhaganlal School of Animal Husbandry, Dairying and Agriculture. The object of this institution is to conduct a technical school for teaching the science and practice of agriculture, horticulture, animal husbandry, dairying, rural health, etc. The school will prepare students (peasant youths) for a certificate obtainable in a year and a diploma obtainable in four years.

The institution will also devote itself to carrying on research work in the above subjects with a view to subsequent application to practical problems of agriculture and rural life such as better cultivation, production of better cattle, production of milk and its products and marketing them.

Institute of Animal Genetics.

Seth Mungalal Goenka has given six lakhs of rupees for opening the Institute of Animal Genetics and Nutrition. The object of this institute is to breed good milk-producing cows and to carry on research in animal breeding and nutrition. Among the trustees are Sardar Vallabhai Patel and the Hon. Mr. K. M. Munshi.

In submitting the scheme to the Government it has been urged that the site for both the institutions should be Anand in Kaira district, which is accepted as one of the best milk providing tracts in the country. About 1,000 acres of land will be acquired for the purpose.

It is suggested that with a view to carrying out the schemes, the Government should transfer the present work of cattle breeding and dairying done in Chharodi and Surat to the institutes, with all good cattle and staff.

The entire scheme has been submitted to the Government for their approval.

Seth Mungalal Goenka, who gave eight lakhs of rupees to the Home Minister for a charitable purpose, desired that rupees two lakhs should be devoted to some educational purposes.

The Home Minister has accordingly prepared a scheme for an institution for the promotion and encouragement of the study of Sanskrit, Hindi, Gujarati and other allied languages and dialects and their literature. The institution will work for the advancement, and spread of these languages and carry on research work. The institution will be started shortly.

—The Hindu, 1st July 1938.

Reviews.

Annual Report of the Veterinary Department, Straits Settlements, for the year 1935.

The Director of Veterinary Research and Veterinary Adviser, Federated Malay States, is also the controlling authority of the Department here with his head quarters at Kuala Lumpur F. M. S. The report does not give information regarding the staff of the department. The revenue of the department derived as examination fees on the animals exported, imported and transhipped was \$ 75,936 as against \$ 80,943 in the previous year. The decrease is attributed to the decrease in imports of live-stock. The expenditure for the period was \$ 70,742, being an increase of \$ 900 over that of the previous year due to ordinary salaries.

Details of various kinds of animals imported, exported and transhipped, their number and sources are given separately for each of the three Settlements of Singapore, Penang and Malacca. So also the different kinds of animals slaughtered monthvar, their price, meat inspection and other details are given very elaborately. A live-stock survey for the first time was conducted to obtain a complete census (excluding poultry). Census figures for each settlement are given in the report.

Under Animal Husbandry, no marked difference has been noted over that in the previous year. Growing of fresh fodder crops at the Dairy Farms and importing of other food stuffs from overseas continued. Sanction was given during the year for the appointment of a Chinese Live-stock Inspector in 1936, to act as a link between the Department and the Chinese pig breeders to overcome the language difficulty in dealing with these farmers. Since no Chinese qualified Veterinary Surgeon would be available it was proposed to appoint a lay man and give him training by the Department itself to do the work of a Live-stock Inspector. It would have been better if the selected Chinese candidate had been deputed to undergo training in one of the Veterinary Colleges before he was permanently employed. This method would be more useful and profitable in the long run.

In many places licensing and inspection of dairies and cattle sheds still continued to be in the hands of the Municipal Health authorities. But hope is, however, expressed in the report that these duties might soon come into the hands of the Veterinarian as in the neighbouring State.

Diseases.

Singapore: Rabies (1907), Glanders (1917), Anthrax (1927), Tetanus (1930) and H. S. (1933) were not reported during the year. The dates in parentheses indicate the year of last outbreak of each of these diseases there. The one small outbreak of Foot-and-Mouth disease in cattle and goats in quarantine station was quickly suppressed. The principal

contagious diseases in Singapore were rinderpest in cattle, Bovine coecidiosis, Swine fever, Strangles in horses, Foot-and-Mouth disease and a contagious disease of imported goats which in many respects resembled Rinderpest but the exact nature of which was not determined. Piroplasmosis and Anaplasmosis in cattle and Trypanosomiasis in cattle and buffaloes were also noted. Tuberculosis in cattle and pigs was also encountered in Abattoirs.

Penang: With the exception of a Goat-pox outbreak, no other serious outbreak occurred in this settlement. One case of Johnes's disease was diagnosed in an ox and a few cases of Tuberculosis in poultry were also observed. The existence of Piroplasmosis, Theileriasis, Trypanosomiasis and Micro-filaria infection was confirmed. There were eight deaths from Foot-and-Mouth disease. There were no cases of Rabies at all.

Malacca: This settlement experienced no serious outbreak of diseases. There was only one outbreak of contagious caprine Pleuropneumonia in goats imported from Calcutta while in the quarantine station. With prompt and strict enforcement of preventive measures this was not allowed to spread out. New-Cattle disease and Fowl-pox prevailed among the poultry with rather severe mortality. Two cases of Tuberculosis were confirmed in white Leg-horns imported from England.

Even though facilities were not available for extensive research work, still a limited number of experimental observations on diseases of animals and poultry with the available materials was conducted on a small scale which yielded results for future reference. These diseases include Rinderpest, a contagious disease of imported Indian goats and a disease of poultry, Goat-pox, contagious caprine Pleuropneumonia, Piroplasmosis, Trypanosomiasis, Fowl-cholera and Foot-and-Mouth disease. Interesting details of these observations and experiments are given in the report.

The Government Veterinary Surgeons in Singapore and Penang attended the meetings of the Rural Boards in their areas. The Government Veterinary Surgeon in Singapore delivered lectures to the students studying in the course of the Diploma of Royal Sanitary Institute and conducted written and oral examinations in Elementary Veterinary Science.

Unlicensed dogs were destroyed in large numbers. Prevention of cruelty to animals ordinance was in force during the year. The Government Veterinary Surgeon at Malacca attended the Animal and Poultry Show and helped in judging.

The report contains details of much useful and interesting work done during the year.

**Annual Report of the Civil Veterinary Department,
United Provinces, for 1935-36.**

The staff consisted of a Director of Veterinary Services, three Superintendents, one Veterinary Investigation Officer, 19 Veterinary Inspectors and 204 Veterinary Assistant Surgeons. There were two deaths, two resignations and one retirement among the last-named class of officers.

The Veterinary Investigation Officer worked on an obscure Canine disease, Ranikhet disease, a type of Canine Septicæmia, Contagious Ecthyma in goats, Coccidiosis, Tuberculosis and John's disease, Leishmaniasis, Bovine contagious abortion and Necrosis of the horn.

Mortality from contagious diseases rose from 27,294 to 29,332, Rinderpest being responsible for this increase.

31 cases of glanders were detected and destroyed; 1349 cases of surra were treated in 26 centres as against 329 cases in the previous year. 60 died in the course of treatment, 30 before treatment and 48 after having been treated and discharged. Rinderpest claimed 18,517 deaths as against 15,078 in the previous year; 30,611 Serum-alone, 96 Serum-simultaneous and 134,555 Tissue virus inoculations were done against this. The last method is much appreciated by the public. Foot-and-Mouth claimed 1,240 deaths, Hæmorrhagic Septicæmia 6315, Black-quarter 139, Anthrax 310 and other bovine contagious diseases 216. 48,933 cases by Serum-alone and 56760 by Vaccine method were protected against Hæmorrhagic Septicæmia, 1677 cases by Serum-alone and 298 by Aggrassin were protected against Black-quarter and 2176 cases by Serum-alone against Anthrax.

1143 birds died from Ranikhet disease in the United Provinces Poultry Association Farm.

In the 180 hospitals and dispensaries 432,611 cases were treated, 71,780 cases not brought to the hospital were supplied with medicines and 77,249 castrations were done. 1,70,451 cases were treated and 15,111 castrations were done on tour. There is thus an enormous increase in the work done both in the institutions and on tour in the year. Only two veterinary institutions were added during the year, total at the end being 180.

745 smears were examined in the four Laboratories. Interesting specimens of parasites and others were added to the Laboratory Museum.

20 cases were given anti-rabic treatment. Two injections of 2-per-cent Naganol solution were administered in an interval of 22 days and in between them two were sandwiched two injections of one-per-cent Tartar Emetic solution, 60 to 100 c.c. at an interval of seven days. The result of this modified technique was under careful watch during the year.

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Out of 1843 animals treated for contagious abortion 35 (including 2 bulls and 4 buffaloes) proved positive. Out of 365 cases tested for Tuberculosis and John's disease in Allahabad and Agra, 8 proved positive and 2 suspicious for Tuberculosis, and 2 proved suspicious for John's disease.

Leishmaniasis infection was for the first time diagnosed in the province. *Leishman-Donovan* was incriminated in etiology. Parasites, indistinguishable from *L. tropica*, were found in the smears sent to Muktesar. Neostibosan did not prove effective even when 8 injections were given. Berberin sulphate as recommended by Bennett was being given a trial.

1024 cases were treated at the Research Station Hospital. A sum of Rs. 1,102-10-0 was realised in treatment charges.

The number of stallions was 54 including the four additions but only 46 were actually employed and they covered 1,773 mares, the average being 38'5 per stallion.

36 important horse and cattle fairs and shows were attended and, in addition, Veterinary Exhibitions were displayed at the district exhibition in several places. Draft rules for the control of diseases in the shows and fairs were being drafted during the year for submission to the Government for approval. For want of finance, much propaganda work was not done. Lectures were however delivered and leaflets were distributed in Patwan schools, agricultural classes, teachers' schools, rural development classes, adult night schools, Government High School and several other places.

The expenditure of the Department was Rs. 4,27,341 as against Rs. 4,12,101 in the previous year and the receipts amounted to Rs. 1,29,019 as against Rs. 1,26,226 in the previous year. 14 compounders were trained during the year. It is satisfactory to note that 20 Sanads were given to the people who helped the staff in their difficult task of inoculating animals. 1,90,900 doses of Rinderpest Vaccine were supplied from the Lucknow Laboratory for use more in the actual outbreaks than in the free areas. This has reduced the cost considerably. The scheme for the creation of a Special tract with augmented staff sanctioned by the Government for the control of cattle epidemic in one of the district was put into operation in Agra District and the results were being watched carefully. It is gratifying to note that the expectation of the Department to get a share of the Rural Development Grant to enable it to take due part in that co-operation which is so essential for the success of the scheme as a whole. *This Journal* advocated this step long ago and commended it to the notice of the Veterinary authorities. The report contains the usual tables and a skeleton map of the province indicating the activities of the Department.

The report is a brief record of increased activities.

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barrels in which the eggs are incubated after a preliminary exposure to the tropical sun. The eggs are examined for fertility after 24 hours incubation and all 'infertiles' forthwith marked. During incubation the eggs are turned 3 or 4 times daily and the temperature checked by holding the egg against the cheek or upper eyelid. A thermometer is regarded with disdain by these expert hatchers, as is also the use of any artificial light for the detection of fertility."

Rinderpest broke out in a few places in all the four States but the following control methods, promptly and effectively enforced, proved quite useful including the spread and mortality:—(1) The prompt segregation of all sick animals and close supervision of incontacts; (2) The enforcement of an order requiring that all oxen, buffaloes, sheep, goats and swine within certain scheduled areas be kept confined to their owners and prohibiting any movement of these animals out of or about the scheduled areas; (3) The completion of a census of all animals in the scheduled areas to ensure that animals were not surreptitiously moved therefrom; (4) The drafting of extra veterinary police into the scheduled areas to see that the quarantine regulations were carried out; and (5) The employment of seventeen watchmen to guard the jungle paths by which movement of animals might be attempted.

The other contagious diseases which broke out here and there were Foot-and-Mouth, Hæmorrhagic Septicæmia, Goat-pox, Swine fever, canine and feline Distemper and caprine Pleuro-pneumonia. No preventive inoculations or vaccinations were carried out on a vast scale but the other controlling methods were effectively enforced in all cases. There were 12 cases of Trypanosomiasis—all in dogs—and they were destroyed. There were no cases of Rabies. There was only one case clinically diagnosed and with P. M. lesions, suspicious of Anthrax in a buffalo. Fowl-pox, Fowl-cholera and an outbreak of one ultra-visible Virus disease prevailed among poultry.

Certain interesting observations are also recorded about Goat-pox, Stone-pox in goats, Fowl-pox, animal nutrition experiments in calves and enquiry into some of the common bovine diseases. S. P. C. A. to the question of over-crowding of poultry during transport by road and rail and a floor space of 50 square inches per fowl was considered reasonable and, on this basis, the maximum carrying capacity of various-sized baskets has been fixed as follows :—

Baskets with a base diameter of 2 ft.	...	10 fowls.
2½ ft.	...	15 "
3½ ft.	...	30 "

This is further made easy for checking by fixing up the weights for these 3 sizes as 20 katis, 30 katis and 60 katis, respectively. The veterinary police were instructed on these lines, to check transport by rail and road. Again in connection with pig transport in baskets on cycle carriers and consequent fracture of their limbs before their arrival at the abattoir, preventive methods were adopted to stop this cruel practice. Another interesting feature is the permanent employment of veterinary police in connection with the prevention and suppression of

contagious diseases of animals, enforcement of quarantine orders, frequent inspection of animals for early discovery of unreported diseases, suspected diseases and deaths of animals. They are also responsible for general enforcement of provision of the cruelty to animals' enactment. Details of much useful work done by this agency are also recorded. The Government Veterinary Surgeon at Perak was responsible for the veterinary supervision and treatment of army horses and mules at Taiping.

The report is an interesting record.

A Guide to Veterinary Parasitology for Veterinary Students and Practitioners. By Mr. T. Southwell, D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.E., and T. Kirshner, M.B., Ch.B. (Capetown) D.T.M. (Liverpool), F.Z.S. Pp. xii+144. Medium 8vo. With 88 Illustrations and 12 Diagrams illustrating Life Histories. Publishers: H. K. Lewis & Co., Ltd., London. Price 7s. 6d. net.

The purpose of this little book on Veterinary Parasitology, as is mentioned by the authors in the introduction, is to serve the needs of the students studying for the Membership Examination of the Royal College of Veterinary Science and for the degree of Bachelor of Veterinary Science, as well as the practising Veterinary Surgeon. In India, in one or two Colleges the syllabus in Parasitology is much higher than what the book can cater. The importance of the study of Parasitology has been appreciated only during the past decade and it is very necessary for this present-day student, who is to continue and maintain the progress made in that subject, that he should be equipped with a more elaborate knowledge of the subject and, therefore, this book can only be a guide to the practitioners.

The scope of the treatise is limited to the continent and it is deficient as regards the treatment given to conditions met with in the tropics. For example, the two conditions caused by *Anchylostoma* and *Spirocerca* in dogs are not at all found in this book. They are common and harmful affections in dogs in the tropics, particularly in India. Moreover there are some misstatements in this book. So the book is not, we regret, in our opinion, useful for veterinary practitioners in India.

Advances in the Therapeutics of Antimony. By Prof. Dr. Phil. Nat. Hans Schmidt, and Dr. Med. F. M. Peter, with a Preface by Dr. Philip Manson-Bahr, C.M.G., D.S.O., M.D., F.R.C.P. Georg Thieme. Publishers: Leipzig, Germany.

This treatise consists of a preface and 252 pages of matter dealing with the clinical experience in human and Veterinary medicines of the various preparations of antimony. In the preface is outlined the history relating to antimony in therapeutics, a very interesting and enlightening chapter to interested readers. What is of greater importance is that the author gives a clear idea of how the various preparations are made use of at the present time and in what doses. These observations ought to be of immense help to both medical and veterinary practitioners.

Obituary.

Mr. A. N. VENKOBIA RAO, G.M.V.C.

We regret, we have to announce the premature demise of Mr. A. N. Venkoba Rao, Veterinary Assistant Surgeon, working at the Madras Veterinary College Laboratory, on 6th May, 1938, after a short illness of four days. He was aged only 32 years. He leaves behind him his wife, a son and two daughters and a host of friends. We offer our heartfelt condolences to the members of the bereaved family.

Mr. R. V. PATEL, G.B.V.C.

Mr. R. V. Patel, G.B.V.C., who retired from Penang Government Veterinary Department as an Assistant Veterinary Surgeon, three years ago, passed away towards the end of last year in his native place, Nadiad, Bombay. Our heartfelt condolences go to the members of the bereaved family.

Dr. G. H. JOSHI, G.B.V.C.

Dr. G. H. Joshi, retired Assistant Veterinary Surgeon, F. M. S., who had been suffering from Broncho-Pneumonia for some time past, died in October 1937, at the age of 60, leaving behind him his wife, a son, two daughters and a host of friends and relatives in Malaya and India.

The late Dr. Joshi was born in Bombay on July 5, 1878, and received his early education in St. Xavier's College there. He later entered the Bombay Veterinary College and qualified in the year 1903. While in Bombay he became a Freemason and soon achieved the highest honours which could be obtained from the Society in the Far East.

In 1906, he arrived in Malaya and was appointed as Assistant Veterinary Surgeon, Parit Buntar, and later held appointments in various towns in the F. M. S., particularly in Ipoh and Taiping. He retired in 1931 after a meritorious service of 25 years with the F. M. S. Government.

In the Colony, too, he took an active part in the Society and was a member of the International Order of the Good Templars. He was one of the original members of the Ipoh Indian Association. During the Coronation of His Late Majesty King George V he was the President of the North Indian Community in Perak.

After his retirement in Penang, he continued to play an important part in the activities of the local Indian community.

His eldest daughter, Miss Nivedita Joshi, is at present studying for Medicine at the Bombay University while his son, Master S. G. Joshi, is the senior Prefect of the Anglo-Chinese High School.

Mr. Y. K. SHETE, G.B.V.C.

It is, with profound sorrow, we have to record the sudden and untimely demise of Mr. Y. K. Shete, Veterinary Inspector, Central Range, Ahmednagar, at Muktesar, while on training.

We offer our heartfelt condolences to the members of the bereaved family.

"Members of the Bombay Veterinary Medical Association, Office staff of the Director of Veterinary Services and other professional brethren assembled in Poona on 4th July 1938, to express their deep sorrow at the sad and sudden death, at Muktesar, while on training, of Mr. Y. K. Shete, Veterinary Inspector, Central Range, Ahmednagar and, share in the grief and bereavement of his widow and family."

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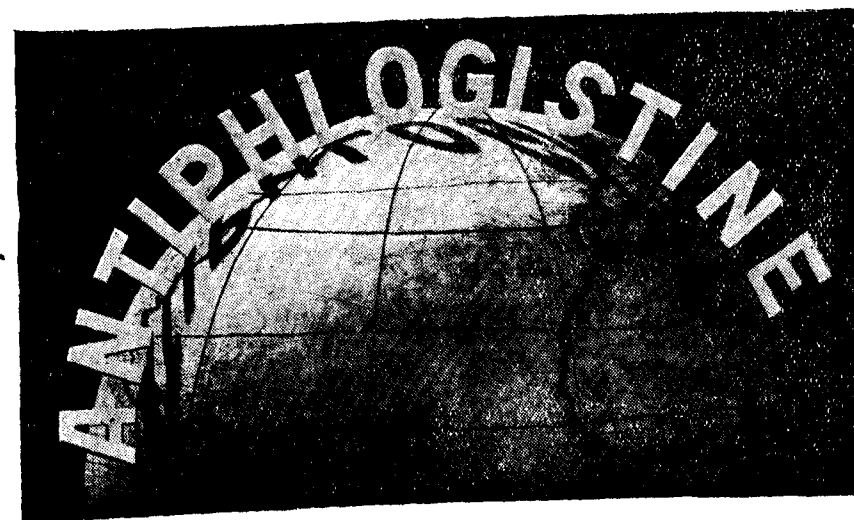
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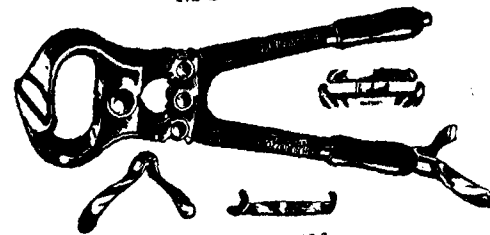


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