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No. 6

THE INDIAN VETERINARY JOURNAL

[THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION]

PUBLISHED ON ALTERNATE MONTHS

471

A BI-MONTHLY
RECORD OF
VETERINARY
SCIENCE.



DEVOTED TO THE
CAUSE OF THE
VETERINARY
PROFESSION.

(ESTD. 1924)

EDITOR

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

Office:—26, Wallajah Road, Mount Road, Madras-2 (S. India)



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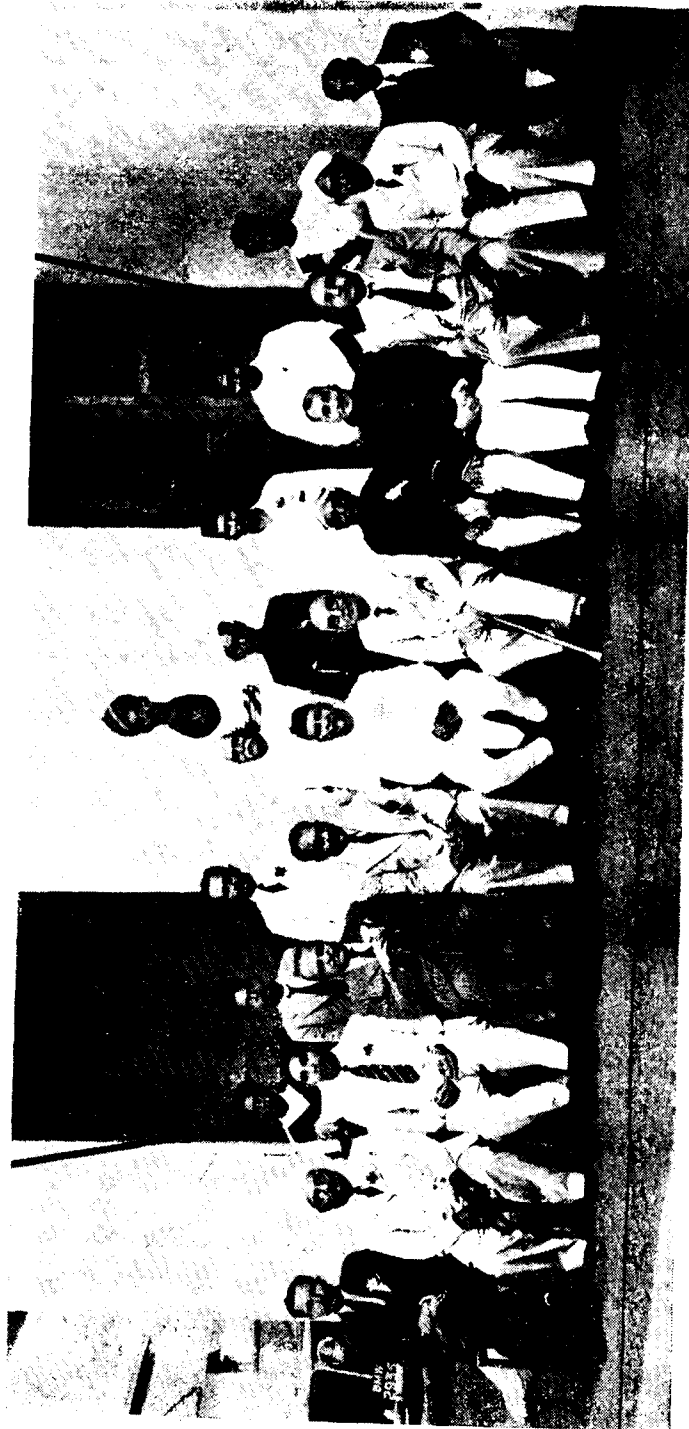
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PRESIDENT

Joint Session of the

10th All-India Veterinary Conference and the
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held at Bombay in April, 1950.

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(The Journal of The All-India Veterinary Association)

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MAY, 1950

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PRESIDENTIAL ADDRESS*

By

DR. S. DATTA, D.Sc., M.R.C.V.S., D.T.V.M., F.R.S. (Edin.), F.N.I.,

Director,

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"Cattle wealth constitutes a very important element
in the prosperity and well-being of every country and
particularly of an agricultural country"

RAJENDRA PRASAD

I greatly appreciate the honour you have shown me in asking me to preside over this Conference, the tenth session of the All-India Veterinary Conference which is meeting here today after a lapse of 14 years—the first one of its kind to be held in Free India at the threshold of a new era of progress. It is particularly appropriate that this Conference should be held at Bombay—not because the previous one was also held in this city. To Bombay State belongs the credit of initiating for the first time in India, veterinary education in English in 1886 and veterinary research in 1890. Sixty years back the first scientific research institute to be established in India, and of which I have the honour of being the first Indian Head, was opened at Poona. The foresight that the Government of the day had in giving the first priority to the organisation of research in India and the insight that cattle form the basic key to the whole economic structure and rural life and welfare of the masses, which this represented, was remarkable and may be remembered, with benefit now particularly as the Diamond Jubilee of the Institute will be celebrated later this year.

*Delivered on the occasion of the Joint Session of the Tenth All-India Veterinary Conference and the Twenty-Eighth Conference of the Bombay Veterinary Medical Association, held at Bombay, on April 25th, 1950.

Surveying the history of the All-India Veterinary Association which has been responsible for convening these Conferences, it may be recalled in passing that it was first brought into being in 1922 and its first conference was held in 1923 at Lahore under the Presidentship of Col. G. K. Walker. The second conference was held at Lucknow in 1924 with Col. H. T. Pease in the chair and the decision to start the *Indian Veterinary Journal* as an organ of the Association was taken. The publication of the Journal within five months of the decision the same year was no mean achievement and the Madras pioneers deserve all the credit for this achievement. Subsequent conferences were held as opportunities occurred at Madras, Calcutta, Bombay and Bangalore etc. until 1936 when the ninth Conference was held at Bombay with Sir Frank Ware as the President. Since then insurmountable difficulties intervened and the activities of the Association were dislocated so that no Conference could be held in the intervening long period. The very fact that the Conference has again assembled shows that the enthusiasm which had cooled down has again revived and members are alive to the enormous opportunities that have opened out in the New Republic before the profession to shape our national destiny, to lay down our policies and adopt methods most suited to the improvement of our national health, wealth and happiness through the development of the enormous nature resources of our livestock wealth.

We have assembled at this Conference to-day to take stock of our past failures, to interest the public and the State in our mission of livestock welfare and improvement, and to receive the recognition that is due to us. It is no use blinking the fact that hitherto veterinarians have suffered due to lack of effective leadership and have failed to find a place in the inner councils of policy making in the country. Veterinarians have remained totally in the background in all scientific and cultural bodies of the country, such as the Indian Science Congress, National Institute of Sciences, Planning Commissions, University Grants Committee, Science delegations etc. Time has now come to assess the present position and to devise effective means to improve the lot of the common man in his daily life through the special services that we can render. In order that we can rededicate ourselves to-day to serve the Republic of the people through spiritual reinforcement, it is necessary to appreciate the features of our ancient heritage as they may guide us in the tasks ahead of us.

Cattle mean much more to India than most other countries, and from the hoary milleniums the cultivator and his cattle have formed the ever important bed rock of national life as the edict in the Rigveda "Let the bullock carry the load and the cultivator till the ground and the plough cut up the earth well" stands as true to Republic India to-day as it did in 4,000 B. C. when that earliest chronicle of human history was written.

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Animal medicine was held in equal honour to human medicine and both were included under *Ayurveda*, the science of life. In Hindu prayers, animals received prior mention to men, and in the laws of Manu (800 B.C.) animals were equally protected as men. This veneration for animal life was further strengthened by Buddhism, and Asoka (270-233 B.C.) forbade the killing of animals, and India still remains the only country in the world to provide sanctuaries for old and decrepit animals (pinjrapoles). This unique feature of Indian thought bespeaks a comprehension not only of the healing science and the kinship of our profession with Medical science, but of what is being strongly urged to day all over the world that veterinarians should be experts in animal health or organised livestock work of all kinds rather than wait upon merely the incidence of disease and restrict activities to disease control.

It is obvious that in the short time at my disposal it will not be possible for me to deal with all the aspects of the vast problems confronting us as *Veterinary Husbandry* workers. I use this term in its widest sense to include all aspects of the conservation, improvement and utilisation of livestock. Experience has repeatedly shown that whenever the problems have been separated into the loose compartments of Animal Husbandry and Veterinary Science, interests have clashed and improvements been retarded. After all an animal forms one biological entity and the idea that its evolution can be brought about by divided administrative units is irrational and unsound.

Looking for the causes of the lack of public sympathy for veterinary husbandry the main reason appears to be a general ignorance regarding the essential role of livestock in the economy of our country. The livestock workers had been handicapped by a dearth of reliable statistics so that they could not marshal facts and figures to convince the authorities or the philanthropists of the country about the soundness of investing in animal industry. In this address, therefore, I am venturing to outline some of these impressive data that are available to us i.e., about the importance of livestock to agriculture, the financial returns in livestock products and the potentiality of the immense improvement which can be brought about in a short time. I shall also deal with some of the steps which our profession can adopt in bringing about these improvements.

The economics of the country are still disorganised as a consequence of the last war and the partition of the country. There exists a great scarcity of human food and the import of large quantities of food grains from outside to meet it and our other preoccupations and commitments have resulted in a great drain of the finances of the country. Nation building departments have had to be more or less starved though Government is fully alive to this fact. The "Grow More Food" campaign which aims at maximis-

ing cereal output, has been intensified greatly and it is hoped that import of food grains will stop from 1951. The emergency required swift short term remedies and livestock development was not given the high priority of Food or Fishery. The colossal task of achieving self sufficiency by developing the resources of this vast country and its teeming millions obviously require planning on a more fundamental and realistic basis and the National Planning Commission has been set up, and Animal Husbandry must claim the full consideration that its potentiality in the national welfare demands.

As stressed before, in our country, Agriculture and Livestock go hand in hand. In many other parts of the world, livestock is looked upon only as a source of nutritious food for the mankind and livestock is ancillary to agriculture. In our country, however, livestock plays a more vital role and agriculture is really ancillary to animal husbandry. Livestock supplies the important and often the only source of motive power for agricultural operations. It is further the mainstay for the transport of agricultural commodities from the village to the market. In the dry regions of the country, it supplies the motor power for the irrigation of lands from deep wells. It is also potentially the chief source of supplying manure to our fields. Until the time when India has got plenty of tractors and transport lorries and has a network of highways connecting even the innermost and most isolated villages and there is cheap electricity and irrigational canals, our country will have to depend on the ox and I can say with the Honourable President of the Indian Union that "that time is far away." Even if it were possible to achieve self-sufficiency in food by mechanisation we shall become dependant on foreign countries for fuels to work these machines. As it is, India is extremely deficient in kerosene and petrol and uses up a lot of her finances for these commodities and the small stocks of these essential fuels for industries should not be diverted to agriculture where their use can be avoided. The wholesale mechanisation of agriculture is sure to throw large numbers of tillers of the soil out of employment which will further accentuate the labour problem of the country. Mahatmaji has already drawn pointed attention to this aspect.

The role played by the livestock in the economy of our country will be apparent from the following figures: By providing transport for agricultural produce, it is estimated that cattle contribute annually approximately 160 crores of rupees, while by way of cattle labour for agriculture, India gets about 300-400 crores of rupees every year. Our cattle produce about 1,000 million tons of dung per annum, nearly 67% of which is burnt as fuel whereas the rest is available as manure. Assuming a value of even Rs. 10/- per ton, the total worth comes to about 1,000 crore. India produces 480 million maunds of milk per year, of which half is converted into ghee. The price of this amount of milk and milk products may be conservatively estimated at 750 crores of rupees. The amount of meat

consumed in India is about 216 lakh maunds. Its value may be put down at 130 crores of rupees. The number of eggs produced is over 300 crores per annum, so that they also bring about 30 crores of rupees. Annually 583 lakhs of hides and skins are produced in our country, whose value is over 40 crores of rupees. The annual production of wool is about 6 lakh maunds, whose wholesale price is about 3 crores of rupees. The inter-state trade in livestock for 1944-45 has been given as 1.66 lakhs of cattle, 15.7 lakhs of sheep and goats and 5.849 horses, ponies and mules. The value of these at the prices at that year works out to about 15 crores. If we add to these figures the economic value of horse and camel transport, about which no information is as yet available, the total cash value of livestock and livestock products amounts to over Rs. 3000 crores per year. Assuming that the average income of an Indian agriculturist is said to be about 3 annas per day, the direct contribution of the livestock towards the people's purse is about 16%. If we add the income from agricultural products which are indirectly derived through our animal allies, the total contribution covers about 2/3 of the income of India. It may be noted that these figures represent the basic estimates of an undeveloped industry in its neglected state, and the scope and potentiality are deserving of the best attention of the builders of our Nation and Republic.

To get a clearer aspect of the economic importance of the livestock in India, let us compare the above figure of Rs. 3000 crores per year with the national income from several industrial commodities not directly connected with Animal Husbandry. The total annual production of coal in India has been estimated to be about 31 million tons. The price of this works out to be only 500 crores of rupees. Even if we add to this the value of coal bye-products like coal-tar, etc., the total annual earning will not exceed 600 crores. Similarly the annual steel production is 1.35 million tons and its value is only 10 crores of rupees. Thus it will be seen that these industries, which have no doubt their own vital position in national economy and over which much money is being spent and a good deal of effort is being expended to increase production, fall a large way behind the somewhat under-developed and neglected Animal Husbandry of the country, so far as national prosperity is concerned.

All these data and arguments have been marshalled to stress how a greater wealth and well-being of the country are linked with animal husbandry improvement. If we take away our live stock or allow them to be inefficient, our hope for self-sufficiency in food will be belied. Unfortunately, this point is very seldom recognised by our countrymen and it is our duty to bring home these facts to them. We veterinarians have an indispensable place in fashioning out the destiny of our country and the sooner we establish our rightful place and contribute our share by improving our livestock assets, the better it will be for the whole country,

When I say that we have to work hard for this end, I am not at all overstating facts. The problems that confront us are simply colossal and as will be shown later, our departments are grossly understaffed to tackle the multifarious aspects of the task ahead of us. Impressive are the figures which I have mentioned, but everyone, who is even remotely connected with animal husbandry knows quite well that judged by world standards, we are a long way behind to derive the maximum possible benefit from our livestock. Our animal population consists of 177 million of cattle and buffaloes, 84 million of sheep and goats, 1.5 million camel, 3.7 million pigs and 58 million poultry. It has been estimated that the Indian cultivator needs 22 bullocks to do the amount of work done by only three animals in Egypt. The chief causes of the degeneracy are perhaps diseases and malnutrition. The annual mortality from rinderpest even now is estimated to be well over 1 or 2 lakhs of animals. Besides this haemorrhagic septicaemia, blackquarter and parasitic diseases also claim a large number of victims. On a moderate estimate, the annual loss of life among livestock through diseases alone may be put at 1 million heads and a much greater number is rendered unthrifty totally or for a considerable part of the year. Phenomenal results have been achieved in the substantial control of all epizootics but the above losses, though only about 10 per cent of what they used to be, are still serious and militate against the prosperity of the masses.

Fortunately these losses are preventible. There are effective vaccines and preventive measures to check the occurrence of most of the commonly known livestock diseases. All that is needed is the money to prepare these biological products in sufficiently large quantities and well trained personnel to administer these vaccines in a planned campaign, as well as to bring home to the ryots, if necessary with the aid of proper legislations, the proper methods of animal management and sanitation. The Indian Veterinary Research Institute has been producing for years large quantities of these biological products. Recently, some States also have started the manufacture of vaccines, but the quantities thus produced are sufficient to inoculate only a tiny fraction of our vast animal populace. In the meanwhile, epidemics continue, taking with them their toll of precious animals and this at a time when the State Governments are trying to bring more and still more land under cultivation and more and more animals are required for the preparation and maintenance of these lands. Given the required monetary help, these diseases can be stamped out in a few years' time and the heads thus saved will be able to play their part in producing easily that extra 10 per cent food by which our country is short.

Rinderpest deserves the first priority of attention in disease eradication programme in view of its devastating effects in paralysing agriculture. The necessary plan to eradicate the disease within 5 or 10

years has been formulated, and the extremely cheap lapinised vaccine has been tested out both in the laboratory and in the field with extremely gratifying results and its mass production as a stable powder to commence the large scale field campaign in the states awaits to be undertaken as soon as the proper equipment is secured. The country is spending 4½ crores of rupees for its Pencillin and Sulphonamide plants and also large sums for B.C.G. vaccine production and field campaigns. There is every hope that the rinderpest eradication programme will be implemented in a similar way.

The problem of animal nutrition is rather complex. In order to get the best out of our animals, we must feed them properly as under-nourished animals not only fail to work and produce efficiently but also fall easy prey to diseases. However, in the competition for the land for producing cash crops, human food and animal feeds, very little is left for growing fodder crops. The result is that our animals have to exist on the bye-products of cash crops and human food, like cotton seed and the straws and cakes. Systematically laid pastures are non-existent and grazing is restricted only to the rainy season of the year. The result is that our animals are grossly underfed and moreover their ration is hopelessly unbalanced. It is the duty of veterinarians and other animal husbandry workers to remedy this through proper propaganda. Establishment of good pastures is a long-term policy, but immediate action may be taken in producing catch crops to feed the cattle. The surplus monsoon grasses can be preserved as hay or silage if the present "Gaon Panchayat" system may help in this venture as these processed feeds can best be prepared and stored by co-operative efforts. The State can also help by devising means to utilise all slaughter house waste materials through the preparation and distribution of such feeds like bloodmeal, bonemeal, tankage etc. Subsidiary industries can be set up to prepare good yeasts for animal consumption. During the last war, Germany perfected several methods for producing yeast from sawdust and waste wood and millions of tons of animal feeds were prepared in this way. Chemical industries can also help by preparing synthetic feeds such as urea which can help to overcome the huge shortage in protein food for our ruminants. Arrangements can also be made to prepare hay or dried grass in the forest areas and these processed feeds can then be transported to the deficit parts. Unfortunately, however, more stress is put in our country on the transport of coal or cement, forgetting that feeds for the livestock are as essential for the welfare of the country as are buildings or industrial products.

These are short term policies but they can all help to increase the efficiency of our animals to a great extent. In order to derive the maximum benefit however we have to work still further. The productive capacity of our animals is the lowest in the world. The average milk yield

per cow in India is only 413 lbs. while it is 7,559 lbs in Netherlands, 7,005 lbs. in Denmark, 6,498 lbs. in Switzerland and 5,576 lbs in the United Kingdom. The average eggs per year per hen in India is only 53, while it is 137 in Belgium, 130 in Ireland, 120 in Denmark and 117 in U.S.A. Indian goats are of an average body weight of hardly 60 lbs. Our sheep produce only 2 lbs. of wool per animal each year. Against them, European, American and Australian goats and sheep are of much superior qualities, their average live weight and wool yields being 3-4 times more. Disease prevention and correct management can surely improve these figures for India, but, to get up to the foreign figures, scientific systems of breeding must be undertaken to bring about improvement in their genetical constitution. Only in that way we can breed animals of high productive capacity for milk, draft, wool, egg etc., so that it will be feasible to reduce the number yet to produce greater efficiency. This lowering of number while maintaining higher productivity will reduce the cost of the animals as well as of the commodities produced from them, so that it will be possible to bring milk, eggs and woollen articles within the reach of every body. As Milk and Eggs are nature's best and most wholesome foods, an abundance of these will bring about a rapid improvement in the national health. The *per capita* consumption of milk and eggs in India is 5 oz. and 0.11 egg respectively, while the optimum advised is 1 pint of milk and 1 egg daily per head. This shows the leeway that we shall have to make. Dairy development is a comparatively slow process, whereas the importance of poultry and eggs in quickly augmenting the production of a valuable subsidiary food is often overlooked. The Government and the general public should be greatly interested in the formulation and implementation of poultry development side by side with the cereal production plan. With the use of mammoth incubators, the Government farms can increase the number of improved breeds of poultry, which can then be distributed to encourage backyard poultry farming. The same arguments apply to the rearing of sheep, goats and pigs, which can breed quickly, are easier to maintain and can be kept under comparatively adverse conditions. Any effort spent in this direction will be the surest means to safeguard the public health. This is not an idle dream. It has been shown by others that with proper management and judicious breeding our animals can be very efficient. Indian livestock have been taken over to U.S.A. and Australia and excellent breeds have been evolved out of them to withstand tropical climate much more efficiently than other exotic breeds. There is nothing intrinsically wrong with either our animals or our climate.

In this connection, it may be worth while to examine how much is being spent on Veterinary and Animal Husbandry projects. We have said before, that our livestock brings in directly 16 per cent of the national income, while the amount ear-marked for their improvement in the central

exchequer is only 0.08 per cent of the total budget grants. In addition, the Indian Council of Agricultural Research is spending some money in co-ordinating the livestock development work in the various States as well as to foster several research and survey schemes throughout the country. Even so, the total amount spent is very small in comparison with those earmarked for other departments. Thus, the grant for the department of scientific research is about 4 per cent for 1950-51. I assert once again that, if an industry is capable of bringing in quick returns, it is the much neglected animal husbandry projects. Yet, while the grant for Veterinary Services by the Central Government was only Rs. 25,75,000 for the year 1949-50, for the same year the Central Government contributed over 2 crores of rupees to one of the regional river valley schemes, the Damodhar Valley Project. Increase of the power resources of India is certainly vital to rapid growth of large and small industries. Whereas animal husbandry improvements will be for the immediate benefit of the whole of India, these multi-purpose river valley schemes are long-term projects only of benefit to restricted parts of the country. Sufficient has been said regarding the importance of livestock in our country and the utter neglect and apathy to which they have been subjected so far. Now that we have attained freedom, the prospects are good and the situation must be changed. We have now, at the helm of our affairs, men who are genuinely interested in the welfare of our country. In our constitution, there is a directive that "the state shall endeavour to organise agriculture and animal husbandry on modern and scientific lines and shall in particular take steps for preserving and improving the breeds of cattle". The objective has been put forward and, with the help of the Government, veterinarians of personality and leadership will have to play their part to make this directive work.

When the immensity of the problem is considered, one cannot but despair that if the present state of affairs continues, our progress will be very slow. We shall have to visualise the days when our country will be free from epizootic disease, the animals will be fed properly and better and more efficient breeds established all over the country. Our work will not cease even then, as we shall have to maintain constant vigilance that the eradicated diseases are not imported again from outside and that the breeds evolved are properly managed. The question now arises whether we have got sufficient men to work these projects efficiently. The answer is very definitely no.

India has about only 10 Veterinary Surgeons per million head of livestock which is totally inadequate. Similar figures for the United

Kingdom and Switzerland are 95 and 248 respectively. Our past rank and file did some fine work under difficult conditions peculiar to early days but a number of them found it difficult to win the respect and recognition from the intelligentsia due to having had no background of the physical and biological sciences and other qualities required to win people's confidence. As early as 1886, Professor J. H. Steel had the ambition to raise the education in the Bombay Veterinary College to a very high standard but, due to his death, the ambition still remains unfulfilled. The standard and requirements of veterinary education has been steadily advancing in most countries, the course extending to five or six years on a fairly high entrance qualification. The profession has thus developed into a learned profession lower to none. It has been found necessary therefore to include in the University of Cambridge in Great Britain, Institutes of Animal Physiology and a Veterinary College is also being started. This should be an eye-opener to us. Veterinarians must have considerable knowledge in all aspects and in all branches of veterinary husbandry. For the reasons developed later in my address they must be capable to man the extension services whose duty it will be to educate and guide the ryots in the proper maintenance of their animals. They will have to undertake police work in controlling the spread of disease from one part of the country to another as well as to prevent the import of diseases from other countries through efficient quarantine measures. They will have to play their part in catering to our countrymen wholesome meat and milk, through meat and milk inspection as well as through the proper preservation of feeds. All these require better equipped personnel to man the veterinary services. Fortunately things have started moving towards the right direction and men of broader outlook, better scientific education and full of patriotic enthusiasm have assumed Directorships in several States than ever before. A number of new Veterinary Colleges have been started in our country. The minimum qualification in most of these Colleges is I.Sc. with biology. Most of these institutions are also affiliated to Universities. Some state Governments have also increased the pay scale of veterinary workers, and others have to follow suit and better quality of students may now be attracted towards the profession and may receive better guidance and encouragement.

There is, however, one flaw in this picture, a legacy from the past. In order to equip the students with the proper kind of knowledge, the heads of the departments of the various colleges should be highly qualified and experienced. They should be not only specialists in their own lines but should have experience in other lines as well so that proper co-ordination between the various departments may be maintained. So

far, the Indian Veterinary Research Institute has been called upon to supply such men to the Indian Colleges and State Veterinary Departments, but, due to financial stringency, the developmental schemes for the enlargement of the Indian Veterinary Research Institute have been kept pending, while the demand due to expansion of State activities has become more than the Institute can produce. The result has been that experienced men have migrated from the parent Institute without the vacuum created by their departure being properly filled up. The time will come when the fountain head will dry up, unless immediate steps are taken to bring about the reorganisation plans for enlarging the Institute and training picked promising men from the States, so that it can keep on training sufficient men to cope with the demands from the various States. The time has come when the leaders of the veterinary profession in this country should pause and think well ahead into the future when we can expect that the demand for competent veterinarians should grow more and more as preventive measures for eradication of diseases and improvement of the livestock will be tackled in right earnest.

For these reasons, I feel that an Indian Veterinary Council which the profession has been clamouring for at least twentyfive years should be established at once in this country. The importance of veterinarians for the well-being of the country is as great as that of medical men. Yet there exists at the present time a wide gulf of difference between these two allied professions. The advantageous position enjoyed by the members of our sister profession is in no small measure due to the protective care of the Indian Medical Council. In other professions also there is a move to get bonded together in similar bodies, which will protect their interest and integrity.

An Indian Veterinary Council should be a statutory body, set up by an Act of the Parliament. Through the medium of this Council, the veterinarians can impress on the people the importance of their profession and thus can get the public support in money and sympathy which are necessary for building up a strong profession. This Council can enforce a certain high uniform standard in all the Veterinary Colleges, so that the graduates may be men properly fitted to carry on the duties of national rehabilitation. Armed with sanctions from the Parliament, it can take effective steps in fighting the livestock diseases and to bring about other improvements through scientific breeding. The Council can interest the central authorities to create an All-India Service cadre for experienced veterinarians who should form the pool from which the States can draw in times of emergency. It can also advise the central authorities to establish a police force consisting of veterinarians to guard the health of our

livestock. It will also act as the co-ordination factor between the various State veterinary departments. Finally, but not the least important of its duty will be to put down all quackery in the veterinary profession.

It is also necessary that every State should have a Veterinary Association. All these State Associations must be affiliated to an All-India organisation. The present All-India Veterinary Association can be expanded to become this Central Association. A non-official Association is able to look after the interests of the veterinary profession more effectively than any purely governmental organisation possibly can but, as practice is private practically non-existent and retired personnel few, the utility and service of the Association can be expanded by it becoming a semi-official body with all official, non-official and retired officers finding their proper places in it. Such a National Association can then sponsor the election of veterinarians to the central and state legislature. In our constitution, there is provision for such nominations. The President of the Union is entitled to nominate 15 persons to the Council of States (The Raja Sabha). These persons should have special knowledge of, or practical experience in, several subjects including science, agriculture, fisheries and allied subjects and are to be nominated in consultations with Universities and scientific bodies. Similar provision exists for the legislative Councils or second chambers in certain states. On account of the importance of livestock development in India, it is imperative that there should be veterinarians among these nominated persons in both the centre as well as in the states.

Further no science stands alone these days. For obvious reasons, in setting up Animal Husbandry programmes, it would be necessary to consult geologists, plant industry workers, irrigation, road and refrigeration engineers and railway people. The All-India Veterinary Association can elect Committees to consult these other scientists about the various problems common to them as well as to us and thus will be able to formulate comprehensive programmes. Such programmes can be placed in the state legislatures by the nominated veterinarians and thus can be enforced throughout the country.

In the XIV International Veterinary Congress, resolution No. VIII recommends that "in each country, consideration should be given to the setting up of a society of veterinarians". Again, in the same Congress, resolution No. XIII reads that, in each country, a permanent National Committee should be established which, in constant co-operation with the Organisation Committee of the country in question, will undertake the work of propaganda for the Congress, to enrol members etc. as well as to propose the representative of the country in the Permanent International Com-

mittee. The All-India Veterinary Association will be the fittest organisation to start this National Committee, provided all the States of the Indian Union are affiliated to the All-India Veterinary Association through their Veterinary Associations (existing or to be established).

It is only when we are all united in an All-India Association that we can think of joining with a world body of veterinarians as envisaged by Lord Boyd Orr. In a lecture delivered at the XIV International Veterinary Congress, he advocated that "the veterinary profession needs a strong international organisation, on the lines of the World Health Organisation, through which governments could co-operate more actively in the elimination of preventible diseases on a world scale. This organisation might be linked up as part of, or at least closely allied with, the Food and Agriculture Organisation". India is destined to take important part in the counsels and welfare of South-East Asia and the All-India Veterinary Association can also play a humanitarian role in arranging to supply the countries in the South-East Asia with their requirements in technicians.

Gentlemen, I have tried in my short address to give you a new line of approach to vitalise the activities of our profession and to enlist public sympathy and support for our work with the help of statistics and the study of the economics of our rural and national life. We have been woefully behind the rest of the world in most matters because of grave under-development of our resources. The productivity of our land and animals has been the lowest in the world and the rate of increase of our population has been considerable. National regeneration therefore involves matters extending beyond the purview of any branch of technical science either singly or in a combined manner. The problems relate to the colossal task of the removal of poverty, dirt, disease and ignorance. No organisation, however well conceived, and no individual, however gifted, and no Government, however sympathetic, can produce quick miracles in these matters. A well-thought out balanced plan placed in the hands of properly trained staff with the proper perspective and executive determination and authority to carry through the work can certainly achieve lasting results if the requisite finances are not lacking.

We have complained, in the past, of lack of interest, inertia and conservatism in livestock development. The greatest stimulus that can be given to the farmer for renewed interest in livestock is to show him that there is money in livestock farming and satisfactory returns are likely to follow to improve his economic status. Facilities such as the provision of manure, livestock and animal feeds at reasonable prices and subsidies where

necessary if granted would provide inducements. In order to be able to maintain and to increase the productivity of his farm he must be assured bodily fitness and stamina by the provision of sufficient quantities of the balanced diet of cereals and animal products that he needs. We must identify ourselves with the farmer and his difficulties in his own environment and give him the assistance he requires to reduce the drudgery and fatigue of his work and to facilitate the making of his career a success. As far as he is concerned, the problem is not the prosecution of new researches and further discoveries, but the fuller application of existing knowledge adjusted to the actual conditions and systems of his life.

The veterinary profession has achieved much in the past in the laboratories and the field and the task of village reconstruction that I have now placed before the profession is gigantic no doubt, but the test of biological efficiency lies in the power to adjust quickly to the environment. I have no doubt that, with self-development, the profession will be able to show its greatness by tackling what now appears to be insurmountable by dint of pooling our resources and solidarity of our profession. The problem of veterinary science belongs to the whole of India and we are dedicated to the service of our Republic totally oblivious of all barriers. Underdeveloped that our country is, many pressing demands for funds are bound to be made on our depleted exchequer. Our cause is noble and our Government is fully alive to the vital importance of livestock industry. In Great Britain, a Veterinary Educational Trust was started a few years ago, which has now taken a more comprehensive function as a private body financed entirely by philanthropists. This trust grants fellowships for the encouragement of research and has actually been spending larger sums to encourage veterinary education and research than have been possible by the Government of the country. Veterinary Colleges in India have in the past been brought into being as a result of the munificence of private benefactors. We have large-hearted philanthropists in this country with live interest in the protection and development of cattle. Besides, it is a happy sign that a number of non-official bodies like the *Go Sewa Sang* with identical interests exist. I would make the suggestion that the Association should place the irresistible facts of the desirability of financial encouragement being given to the study of all livestock problems before them. I have no doubt that the State Veterinary Associations can co-operate with the All-India Veterinary Association and take necessary steps in the matter to stimulate and canalise public effort in this direction.



M. S. SASTRY, G.B.V.C.,
The In-coming President of
THE ALL-INDIA VETERINARY ASSOCIATION



Khan Sahab N. D. DHAKMARVALA, G.B.V.C.,
The Out-going President of
THE ALL-INDIA VETERINARY ASSOCIATION



V. R. RAJAGOPALAN, G.M.V.C. Dip. Bact. (Manchester)
who has been appointed as Director of
Animal Husbandry, Madras.



T. J. HURLEY, M.R.C.V.S., D.V.S.M.,
Retired Director of Animal Husbandry, Madras.

Proceedings of the Joint Session of
The Tenth All-India Veterinary Conference and
the 28th Conference of
The Bombay Veterinary Medical Association
held at Bombay on 25th, 26th, 27th and 28th April 1950.
(First Day - Tuesday, the 25th April 1950)

Amidst scenes reminiscent of good old days, with abundance of public enthusiasm, goodwill and support all round, the All-India Veterinary Association recommenced its activities by availing itself of the invitation of the Bombay Veterinary Medical Association and holding a Joint Session of the Tenth All-India Veterinary Conference and the 28th Conference of the Bombay Veterinary Medical Association at Bombay on the 25th April 1950, and on the following three days with Major S. Datta, D.Sc., M.R.C.V.S., D.T.V.M., F.N.I., Director of the Indian Veterinary Research Institute, Mukteswar, as the President.

The Joint Session was held in the gaily decorated hall of the Bombay Veterinary college and commenced at 4.30 P. M. on the 25th of April 1950. There was a large attendance of members of the profession, invited guests and students of the Bombay Veterinary College. His Excellency Raja Maharaj Singh, the Governor of Bombay, who inaugurated the joint Session, arrived punctually at 4.15 P.M. and was received by Khan Saheb N. D. Dhakmarvala and Dr. D. S. Laud and introduced to the members of the Reception Committee. It was, indeed, a moving sight to see the Grand Old Man of the Profession, Khan Saheb N. D. Dhakmarvala, in spite of his very advanced age and physical disability, moving about to receive the guests and renewing contacts with members of the profession, old and young. Introductions over, His Excellency and party were taken round the hospital by Dr. S. R. Chadha, B.Sc., M.R.C.V.S., Principal of the Bombay Veterinary College. His Excellency evinced great interest in what all he saw and made detailed enquiries about the working of the institution. A group photo was taken with His Excellency and the party was led to the dais amidst vociferous cheering and the clicking of cameras.

The proceedings commenced with the singing of Vande Mataram by Sri R. F. Patil in a melodious voice. Dr. G. R. Murkibhavi, Hon'ble Secretary, then read messages wishing the Conference success following persons :—

Hon'ble Shri B. G. Kher, Chief Minister, Government of Bombay, Hon'ble Jivaraja N. Mehta, Minister for Public Works and Housing, Bombay, Hon'ble

Malojirao M. Naik-Nimbalkar, Minister for Industries and Labour, Bombay, Shri, P. S. Kumaraswamy Raja, Chief Minister, Government of Madras, Hon'ble Shri Hari, Krishna Mehtab, Chief Minister, Government of Orissa, Cuttack, Rai Bahadur P. N. Nanda, Animal Husbandry Commissioner with the Govt. of India, New Delhi, Shri Zal R. Kothavala, Ministry of Agriculture, New Delhi, Sardar Datar Singh, I.C.A.R., New Delhi, Hon'ble Shri K. Chengalraya Reddy, Chief Minister, Government of Mysore, Hon'ble Shri Nityanand Kanunge, Minister for Development, Commerce and Labour, Government of Orissa, Dr. R. G. Ghayagude, Seth G. S. Medical College, Bombay, Sir Dinshaw Petit, Bombay, The Registrar, University of Bombay, Dr. J. M. Mukherjee, Indian Agricultural Res. Inst., New Delhi, The Director, Remounts, Veterinary and Farms, Army Headquarters, Simla, Lt. Col. K. P. Nair, Simla, Dr. H. K. Lal, Dy. Director, Animal Husbandry Dept., Meerut, U. P., Dr. H. B. Shahi, Director of Veterinary Services, Nagpur, Dr. M. I. Malik, Director of Veterinary Services, Patna, Bihar, Dr. S. Gurbachan Singh, Director of Animal Husb. & Vety. Services, Orissa, Dr. S. K. Sen, Animal Husbandry Officer, Patna, Bihar, Major General D. S. Brar, Colaba, Bombay-5, Lieut. Col. U. C. S. Misra, Poona-3, Rao Bahadur B. K. Badami, Hyderabad, Major W. V. Soman, Baroda, Dr. K. B. Mankad, Bombay, Mr. E. A. Nadirshah, Bombay, Dr. Alma Latifi, Bombay, Dr. H. K. Gad, Indi, Secretary, Cochin Veterinary Association, Shri F. D. Wadia, Poona, Dr. M. Hanumantha Rao, Peddapur, Dr. K. Ranganatha Rao, Bangalore, Gosewa Sangh, Nalwadi, Wardha, Dr. G. Venkatachalam, Hosur, Vets., Mukteswar, Dr. M. U. Yohal, Dhrangadhra, Dr. Shiggaon, Dharwar, Dr. S. D. Achar, Mysore, Dr. M.K. Garudachar, Mandya, Mysore, Dr. H. R. Rangaswamy, Bangalore, Dr. G. N. Srikanthiah, Bangalore, Dr. H. A. Chaya, Ahmedabad, Dr. N. S. Chopda, Dholka, Director of Animal Husbandry, Madras, Dr. K. S. Nair, Trivandrum, Dr. Narsingh Pershad, Hyderabad, Dr. F. C. Bhuyan, Secretary, Assam Veterinary Graduates' Association, Dr. S. C. Bora, Kamrup, Assam, Dr. H. P. Kapur, Mathura, Dr. S. G. Iyer, Izatnagar, Shri M. D. Bhat, Bombay, Dr. M. R. Mahajan, Asst. Animal Husbandry Commissioner, New Delhi, Sri M. S. Murty, Bangalore, Dr. V. P. Menon, Irinjalakuda, Dr. V. R. Rajagopalan, Mukteswar.

Dr. D. S. Laud, the President of the Bombay Veterinary Medical Association and the Chairman of the Reception Committee, then welcomed the gathering with the following speech.

YOUR EXCELLENCY, LADIES AND GENTLEMEN,

It gives me great pleasure to extend to you a most cordial and hearty welcome on behalf of the Bombay Veterinary Medical Association to this Joint Session viz. the 10th All-India Veterinary Conference and the 28th Annual Conference of the Bombay Veterinary Medical Association which is being held to-day.

It may be recalled that this is the 4th time that Bombay has its proud share of inviting the All-India Veterinary Association to hold its conference in our great city. The last occasion was in 1936, at the time of the Golden Jubilee of the Bombay Veterinary College (our Alma Mater), which was celebrated by our Bombay Association with such great success. Our Association again feels proud of its share of the highest contribution made to the Silver Jubilee Celebration of the *Indian Veterinary Journal* (the organ of the All-India Veterinary Association, our parent body) held in July 1949 at the

Madras Veterinary College. As you all know only too well, the Journal is printed, published and edited in Madras City by the able Editor, Dr. P. Srinivas Rao, G.M.V.C., an enthusiastic member of our Veterinary fraternity, who has spared no pains and money to make this Journal a success in this country during the 25 years of its existence (Loud cheers)

I am fully aware that many of you have travelled long distances leaving important engagements to attend to-day's function in Bombay. Your presence here testifies to the affection you bear towards the All-India Veterinary Association and also to the Bombay Veterinary Medical Association which has invited the former to our great city. This leaves no doubt in my mind that, with such well-wishers present, our Joint Session will be a great success. More so because we shall have the presence of a distinguished Veterinarian, Dr. S. Datta, D.Sc., M.R.C.V.S., D.T.V.M., Director, Indian Veterinary Research Institute, Mukteswar, to preside over the session.

As for to-day's function, we are very fortunate in having His Excellency Raja Sir Maharaj Singh, the Governor of Bombay, as our Chief Guest of honour to inaugurate this function which is the first of its kind in Free India.

His Excellency is well known to all of us, but it will be in the fitness of things to recollect the valuable services he has rendered to the Government and the country.

His Excellency Raja Maharaj Singh, M.A., Bar-at-law, is the scion of an illustrious family from the Punjab, his father being the late Honourable Raja Harnam Singh of Kapurthala, who for a number of years was a member of the Council of State and Honorary Secretary of the British Indian Association of Oudh Talukdars. His Excellency Raja Maharaj Singh had his education at Harrow and Balliol College, Oxford, and was called to the Bar in 1902. Having entered the U. P. Civil Service, he held several important offices in the Provincial and Central Governments. He also served in Jodhpur State in 1931 and became its Chief Minister till 1932, when he was sent by the Government of India to South Africa as their Agent, a post he held with great distinction. He returned to India in 1935. His reports on the working of Co-operative Credit Societies in 1908 and 1909 and on Indian Emigration to Mauritius and British Guiana and on his mission to Kenya, published in 1928, are considered as authoritative documents on these matters. He has a special knowledge of Indians Overseas and is a great administrator. H.E. Raja Maharaj Singh is a great sportsman, having played foot-ball and cricket and won many tennis trophies. Even now he takes keen interest in sports and has often played cricket matches and skippered his eleven.

In my Presidential Address to the 27th Annual Conference of our Bombay Association in April 1949, I dealt at full length on various Veterinary subjects viz. Veterinary Education, Role of cattle wealth in India, Animal

Husbandry matters, Government Milk Scheme at Arey in Greater Bombay, Facilities to be had for the study of Zoo technique in the Bombay Zoo, Cases of Tuberculosis amongst Sambars and Llamas and other infectious diseases amongst the Zoo inmates of Victoria Gardens during my time as Superintendent (1925-1936) and last but not the least important B.C.G. vaccination and its value in the control of Bovine and Human Tuberculosis. I, therefore, now propose to be brief as the time is limited and as, further, the address of Khan Saheb Dhakmarwalla, the President of the All-India Veterinary Association, will follow.

There has been a thick rumour, which has not as yet abated even after the lapse of two years or so, that the Bombay Veterinary College, the pioneer Veterinary Institution in India is proposed to be shifted to Poona and amalgamated with the Agricultural College there. It is also rumoured that the standard of admission is to be lowered from the present Inter Science 'B' Medical Group to that of Matriculation. The first proposal is probably on the recommendations of the Administrative Enquiry Committee of 1948 that Animal Husbandry was very closely connected with general agricultural activity; the second one, on account of the few students taking up Veterinary course and the lack of sufficient personnel to join the Bombay Civil Veterinary Department.

I have fully dealt at length with these two proposals in my Presidential Address last year. But I make bold to reiterate that the Administrative Enquiry Committee have been given false impression regarding the scope and functions of the Veterinary Department. This is not the least surprising because this Committee did not find it convenient to call upon a single witness from the members of the Veterinary Profession, not even an official of the calibre of Mr. Laxmi Sahai, the present Director of Animal Husbandry and Veterinary Science in Bombay; nor even his predecessor Mr. P.N. Nanda, the present Animal Husbandry Commissioner to the Government of India at New Delhi, nor even retired Government officials like Rao Bahadur Phadke, the first Indian Principal of the Bombay Veterinary College, nor its retired Vice-Principal, Professor N. D. Dhakmarwalla, who is the grand old man of the Veterinary Profession with ripe experience in India. The previous Animal Husbandry Commissioners like Col. Sir A. Olver, F.R.C.V.S. and Sir Frank Ware, F.R.C.V.S., have given their considered opinion that Animal Husbandry forms a part and parcel of Veterinary Science and that there is no better person than a Veterinary Graduate to carry on the functions of Animal Husbandry operations and livestock management. This view was based on the comprehensive study and knowledge which the Veterinary Graduate has to acquire in the course of his Veterinary studies which deal with the Anatomy of domesticated animals, their Physiological and racial characteristics, their breeding, feeding and hygienic management, their Pathology and treatment of the diseases and injuries, their relation to man with regard to inter-communicable diseases and to his use of their flesh and products.

With regard to the proposal of amalgamation of the two courses, we find nothing in common with Agriculture except the subject of Animal Husbandry. Even in basic sciences, the approach and the emphasis given on the portions differ entirely from each other.

It is for these reasons that Animal Husbandry and livestock management are with the Veterinary Departments in the Punjab, Madras and other provinces where much useful work and progress have been achieved by the Veterinary Officials in charge. In Bombay, on the other hand, the Animal Husbandry and livestock operations are mainly entrusted to the officials of the Agricultural Department on some preconceived notions, based on some false impressions, with a Veterinary Surgeon, designated the Director of Animal Husbandry and Veterinary Science, only as a figure-head!

As regards the reduction of the course and the lowering of admission qualification to that of Matriculation standard, which is the remedy of Government to attract more students to the veterinary profession, with a view to augment the personnel of the Bombay Civil Veterinary Department, I am afraid that this is not going to solve the knotty problem unless the pay and prospects are improved and brought up to those obtaining in the Punjab Veterinary Services or, at least, in the Madras State, where the Veterinary profession has become popular. This, to my mind, is the only solution. Even the Bombay Municipality has tackled the problem rather efficiently and it is hoped that the Bombay Government will follow suit and model their services on the standard prevailing in the Punjab or Madras.

With regard to the shifting of the college to Poona on the plea that facilities for the study of Animal Husbandry are not sufficiently available in Bombay, it may be mentioned that the Government of Bombay Milk Scheme at Arey in Greater Bombay, with 15,000 milch cattle stationed in one colony, can afford such ideal and better facilities for the study of Animal Husbandry, livestock management, and dairying methods than any where else in the province. Even so for Post-Graduate study.

With the growth of our Nation and the Independence we have attained, it is essential to maintain a proper standard of education, parallel to that of foreign countries, as our most important concern. Like Medical and Engineering, Veterinary Science also is fast developing; but we lack adequate facilities for advanced and specialized training in India. It is therefore essential to send our graduates for postgraduate study to foreign countries for advanced training in Veterinary Science, so that on their return they would be in a position to carry on the specialized type of work and then train graduates with higher standard of education. One more point which I have to stress in favour of the present standard of Veterinary Education, with a B.Sc. (Vety.) degree of the Bombay University, is its recognition by the Army authorities who have agreed to offer direct commissions to the Veterinary Graduates, which privilege was

confined only to M.R.C.V.S. in the past. This, I am sure, you will all agree is an admission by the authorities that our B.Sc. degree is on a par with the qualification of M.R.C.V.S. I am afraid all these will *ipso facto* cease with the lowering of the standard of the Bombay Veterinary College and its amalgamation with the Poona Agricultural College. What is more serious is that the graduates of this college will then be graded as second rate to those qualifying from other colleges like the Punjab and Madras.

It is for this reason that we must have a strong All-India Veterinary Council at the Centre, which will give guidance to all the States in India in matters of Veterinary Education. To quote the words of Dr. Datta, our president-elect, there is no uniformity of Veterinary education in all the provinces. Out of nine colleges which exist in this country, six (Hissar in the Punjab, Madras, Bombay, Mathura, Jubbulpore and Hyderabad-Deccan) are affiliated to universities, while the remaining three (Bengal, Bihar, and Assam) are not. It is also very unfortunate that the length of Veterinary Course varies considerably in different colleges. Some have adopted a shorter course, others longer. Admission in some colleges are based on Matriculation and in others Inter-Science. With this multiplicity in qualification there is great amount of confusion and chaos created by producing a variety of Veterinary Graduates of different professional standards. India is one country and the requirements of livestock in different parts are more or less comparable, while the interests of the whole country are one and indivisible. Besides, any multiplicity of qualifications weakens the profession by creating camps within its own ranks. Therefore, with a view to ensuring a uniform standard of Veterinary education, it is quite essential to have a Veterinary Council, which will take a lively interest in guiding, supervising and developing Veterinary Education and Veterinary Research in this country and look after the general interest of the profession much on lines similar to the Indian Medical Council." It is for this reason I now appeal to the representatives of the various Veterinary Associations in India, who are present at this conference to-day, to make an united effort with the Government for the formation of our own Indian Council.

Another important step to be taken is the Registration of Veterinary Surgeons. We in Bombay have taken this step and are in communication with the Bombay Government and hope to pursue the subject further.

In concluding my remarks I cannot but quote the wise words of Lord Boyd Orr, D.Sc., M.C., F.R.S., the recipient of the Peace Nobel Prize, from his lecture on the "World Food Situation" delivered at the XIVth International Veterinary Congress in London on the 8th August 1949. He stated that "it is evident that there are many diseases of animals causing huge losses in food-stuffs such as meat and milk throughout the world. While, in some countries, these losses are to a certain extent controlled by an efficient Veterinary Service, in many others the facilities for this service are not granted. If the control of animal diseases could be organised on a world wide basis, there is no doubt that,

with our present knowledge, we can enormously increase the amount of dairy and meat products available for human consumption. It is difficult to estimate the loss in human food-stuffs throughout the world due to preventable diseases in animals, but it must run to millions of tons per annum. Here there is a great field for Veterinary Science. Unfortunately, like all other branches of biological science which seek to enrich the world in the equal interest of the people of all countries, it is starved for funds in India. The Veterinary Profession needs international organisation on the lines of the World Health Organisation, through which Governments could co-operate more actively in the elimination of preventable diseases on a world scale. It might be linked up as a part of, or at least closely allied with, the Food and Agricultural Organisation. The difficulty is to get the necessary funds and get Governments to co-operate. It is perhaps to Congress such as this that the world must look for a lead'. He further stated that 'in addition to considering technical problems which are of interest mainly to the professors, this conference should consider ways and means for a greater unity in the Veterinary work of the different countries, and how best the Research Stations and Services of the better-equipped countries can assist those that are worst-equipped and in most need of an application of Veterinary Science. By such international co-operation in applying science for the benefit of the people of all countries, Governments may become less obsessed with political conflicts and more inclined to work together for the mutual advantage to create a world of plenty. Such international co-operation can be an important step to a world of unity, prosperity and peace.'

Since my writing this address I find from the papers that the wise words of Lord Boyd Orr have borne fruit. The Government of India, it appears, in conjunction with the various States Governments propose to establish 625 centres in the country for the improvement of breeds of cattle by various methods as announced by Sardar Datar Singh, leader of Indian delegation and Chairman of the Food and Agriculture Organisation Conference, when winding up the discussion on live stock breeding, held at Lucknow on 17-2-50 under the auspices of the U. N. Food and Agriculture Organization. The Animal Husbandry Commissioner to the Government of India, Mr. P. N. Nanda, submitted a report at this Conference, drawing attention to the vastness of the country and the wide variations in the environment and conditions under which live stock were bred and maintained in India. He pointed out that there were 136 million cattle, 40 million buffaloes, 37 million sheep and 46 million goats in India in addition to other animals numbering over three million. Dealing with the bovines first, Mr. Nanda further stated that there were about 30 recognized types of cattle and six of buffaloes. Unlike other countries where cattle were mainly used for production of milk and meat, the dual function performed in India was the supply of milk and draught cattle. Experts from Burma, Ceylon and Indonesia likewise submitted reports on livestock breeding in their respective countries to this conference. This is a happy

augury and let us congratulate the Government of India on the move made in this important problem of live stock breeding in this country (Times of India, Saturday, 18th February, 1950).

I do not wish to try your patience any longer. However, allow me to thank all those who rendered me help and co-operation in carrying out the work of our Association, especially the Managing Committee for their whole-hearted support. I am also thankful to the guests for their presence at this conference. My thanks are due to Mr. S. R. Chadha, the Principal of the Bombay Veterinary College, for kindly permitting to hold this joint conference in the college premises.

In conclusion, I beg to thank His Excellency Raja Maharj Singh, our sporting Governor of Bombay and the Chief Guest of to-day, for so very kindly accepting our invitation and sparing his valuable time to inaugurate the Joint Session of the 10th All-India Veterinary Conference and the 28th Annual Conference of the Bombay Veterinary Medical Association. I now request His Excellency to declare the conference open. (Prolonged cheers).

Khan Saheb N. D. Dhakmarwala, President of the All-India Veterinary Association, rising amidst cheers, added his welcome to the gathering in the following speech. Khan Saheb read the beginning of his speech and then requested Prof. K. R. S. Aiyar to read the remaining portion for him.

YOUR EXCELLENCY, LADIES AND GENTLEMEN,

As the President of All-India Veterinary Association it gives me great pleasure to welcome you for this Joint Session. The President of the Bombay Veterinary Medical Association has already thanked in suitable terms H. E. the Governor of Bombay for his presence here and therefore I do not wish to say more than to add that we consider it a great honour that the Governor of a Province has kindly consented to inaugurate a Conference which deals with the veterinary matters of the whole of the Indian Union. Our Conference meets here to-day after an interval of nearly fourteen years. We are very sorry for this lapse which has been caused by unavoidable circumstances, the most important of which was the World War II and its aftermath such as shortage of food and transport difficulty. Although these still exist, we have thought it fit to hold the Conference in Bombay at the time when the Bombay Veterinary Medical Association holds its meeting. We trust that, with your co-operation and goodwill, our discussions, deliberations and decisions will prove successful as in previous years.

Since the inception of the All-India Veterinary Association, this is the fourth time that we meet in Bombay. The first was in 1927, the second in 1934, and the third in 1936. Such All-India Conferences were also held in previous years in Lahore, Lucknow, Madras, Calcutta and Bangalore. It is needless for me to go into the question of the necessity of holding such Confe-

rences. The results that have accrued from them are sufficient answers about their usefulness and they compel a very favourable verdict for their continuance in future. We have therefore to thank all the members of our profession and others who have come as representatives of different Associations, Municipalities etc. It is no small pleasure to meet and greet you all who have come from long distances. I trust that Bombay which is considered to be the second City in India will do its utmost to make your stay here a very pleasant and profitable one. I also sincerely hope that when you return to your homes you will carry pleasant and happy remembrances of your visit to this City of which we are so proud. I think that Bombay could claim, as far as veterinary Associations are concerned, to be the pioneer, as the Bombay Veterinary Medical Association was started in 1886.

The object for which we have assembled here to-day is well known to all of you. We have to confer on various matters of interest for the advancement of our profession, to devise measures for the further progress of our activities, to compare notes, to settle our doubts and difficulties and to help one another in the solution of many problems confronting us. For the success of such Conferences, it is incumbent on all concerned to do their part and send as many representatives as possible to attend the meeting. It is now fairly well realised that the health of the livestock of each State is inter-dependent on the freedom from disease of the stock in the neighbouring State. Therefore, when we confer in a body, we disperse much the wiser. It is no use meeting every year and passing resolutions. It is incumbent on us to chalk out a feasible programme for the future progress with high ideals in regard to different subjects. We must try to induce Government to see matters from our point of view. It is only by a judicious propaganda that an organized profession wishes to advance and progress.

The All-India Veterinary Association was formed in the year 1923 and almost the very first resolution that it passed was to start an *All-India Veterinary Journal* in English as soon as possible. Madras took up the matter seriously, accepted the responsibility, and within a short time was able to send out the first issue of the *Indian Veterinary Journal* in August 1924 under the Editorship of Shri Pangal Srinivas Rao, G.M.V.C. (cheers). His name is now a by-word with the Veterinary profession in India and outside. The Silver Jubilee of the *Indian Veterinary Journal* was celebrated in July 1949 and glowing tributes were paid to the Editor for the services rendered by the *Journal* for the cause of the profession. The Editor's portrait was also unveiled on the occasion and placed in the Madras Veterinary College Library to show in a small way how his work as Editor was appreciated.

Through the efforts of our Association we have been able to bring about vast changes in Veterinary Education in the different veterinary colleges in India. A lot more still remains to be done and for this purpose it is essential to have

an Indian Veterinary Council like that of Indian Medical Council so that it can take 'a sustained interest in guiding, supervising, and developing the Veterinary Education in the whole of India'. This necessity has been felt for a very long time and, although mention has been made about it from time to time in our Organ, *the Indian Veterinary Journal*, no concrete steps have been taken for its realisation. Recently in February 1949 this matter formed the subject for discussion at the Animal Husbandry Wing Meeting held in Mysore in which there was unanimity about setting up a statutory body—the Indian Veterinary Council—by an act of Central Legislature. It will safeguard the interests of our profession on the lines of the R. C. V. S. in U. K. It will also take up the question of reciprocity in the recognition of veterinary qualifications between this country and others so that our graduates may not find it difficult in getting admission to Post Graduate courses in foreign countries. But it is unfortunate that better class of students are not attracted, because they do not find it sufficiently remunerative to seek admission to veterinary profession. Hence Government should offer better emoluments to attract better type of persons to this profession. A Veterinary Council will be an authoritative body to make Government realise their responsibility in this matter. Therefore we should be united and demand with one voice the formation of the Indian Veterinary Council. Another important matter which our Association has been asking the Government is to provide Patho-Bacteriological Laboratories in each Veterinary Institute to conduct Veterinary Research because we know that Veterinary Research has proved of great benefit not only to animals but also to mankind.

The Indian Veterinary Research Institute, Mukteswar, whose Director, Dr. Datta, is our President-elect for this Joint-Session, is the only well equipped Research Institute in our country. It has got a fine record of original research work. It is engaged also in evolving plans to eradicate the main contagious diseases of animals from the country and recently, we are told, a plan for eradication of Rinderpest has been submitted to the Central Government. Also the Animal Genetics section which was started in 1944 has done useful work. The large scale adoption of Artificial Insemination has gone beyond the laboratory stage and four regional centres are operating to popularise this method in the various provinces. Thousands of successful inseminations have been recorded and the provinces are so pleased that they intend to absorb these centres in Animal Husbandry departments.

Another important matter which is engaging the attention of our Association is the supply of pure milk in cities at a cheap rate and it is satisfactory to note that Bombay has taken the lead in this matter. The Government of Bombay have worked out a scheme and have acquired nearly three thousand acres of land for a Milk Colony at Arey near Goregaon about 20 miles north of the city and have constructed there a large number of modern Dairy Farms which are given out to owners of milch cattle from the city at

reasonable charges. Thus the overcrowding of the milch cattle in the city will be removed by vacating the present insanitary stables by stages. All the milk produced at the Colony is taken over by the Government and distributed after pasteurising at a cheap rate. I would advise the delegates to visit this Farm. If this plan proves successful other centres can be opened. It must be remembered that when milch cattle are cared for, lands grow richer, children grow healthier, debts become fewer, and civilisation advances.

The All-India Veterinary Association has supplied a greatly needed platform and a Press for the Veterinary profession in this country. With its help, much has been achieved already but a great deal more is still to be achieved. The past achievements have been possible because of the hearty co-operation from the members of the profession and I am sure that all members will continue to extend their help to the Association and the *Journal* in future also. What was the position of the profession nearly three decades ago and what is it to-day? A comparative study will give the required answer.

The Art and the Science of Veterinary profession is entrusted to our care in Free India. Her sons should realise their responsibility, march onwards in this walk of life with Jai Hind on their lips and should avoid to be a clog on the wheel of progress of Free India.

It would be impossible to thank adequately all those who have helped to make this Conference a success but I must mention one name in particular and that is of our energetic General Secretary, Shri M. S. Sastry, (loud cheers) who, notwithstanding his weak eyesight, has continuously laboured hard and reminded me from time to time to hold the Conference in Bombay. I have also to thank the Principal of the Bombay Veterinary College for allowing us the use of the premises of the college. We have tried our best to make this Conference a success and, if there be any shortcomings, you will kindly forgive us. With these words, I second the proposal and request His Excellency to inaugurate the joint session. (cheers)

Garlanded by Dr. M. S. Sastry, the General Secretary of the All India Veterinary Association, His Excellency Raja Maharaj Singh then inaugurated the Conference with the following address:—

DR. LAUD, DR. DHAKMARVALA AND GENTLEMEN,

I thank you for your kindly welcome and for your more than generous references to me. It gives me great pleasure to be with you today for you are doing work which is as necessary as it is valuable. Veterinary science is a subject which has interested me for years. This is but natural in the case of one who has occasionally kept horses and cattle and much more often domestic animals who form one of the pleasures of life. The keeping of pets in households is a common phenomenon and

in many countries Societies for the Prevention of Cruelty to Animals are doing excellent work. Animals do not possess in full measure the power of articulating their thoughts in a language intelligible to man. All the more, therefore, it is the duty of mankind to look after these helpless, though most useful creatures and to do everything to mitigate their distress and to improve their breeds. Veterinary science deals with such problems. Apart from its sentimental aspect, the care of animals and the betterment of their living conditions is of practical importance. To the agriculturist his cattle are his capital as much as his agricultural tools and seed. They are not only used for draught purposes but they are also an important source of nutrition as they yield milk. The conservation of our cattle wealth is as necessary for the amelioration of the economic and physical condition of our agriculturists as the conservation of any other item of national wealth. The Veterinarian must have a thorough knowledge of the anatomy and physiology of domestic animals and of the causes and effects of the diseases common to them. He must further be a keen observer for he has inevitably to rely wholly on his own observation in making a diagnosis. One of the most valuable services that the Veterinarian renders is the detection and prevention of contagious diseases among animals.

Let me now tell you in brief what the Government of Bombay has done for the advance of veterinary science in this State. The Bombay Veterinary College, which formerly had a diploma course in Veterinary Science, has been affiliated to the Bombay University. The course of instruction now extends over four years. The first batch of students taking this course passed in 1949. The fact that veterinary graduates will henceforth hold a university degree will tend to raise their status. Additional personnel with appropriate subordinate technical staff has been appointed and the teaching imparted at the College is now of a higher order. One of the important duties of the Veterinary Department is the control of contagious diseases which levy a heavy toll every year. To overcome the difficulty due to the inadequate supplies of the requisite vaccines and sera from the Indian Veterinary Research Institute, the establishment of a Biological Products Station has been sanctioned, a qualified officer has been appointed to take charge of this Station and land is being acquired in Poona for the construction of necessary buildings. Since, however, it will be some time before the necessary buildings can be erected at the site, the Superintendent of the Biological Products Station has been accommodated temporarily at the Lazaretto attached to the Bombay Veterinary College. He has already started the work of manufacturing vaccines and sera on a small scale. The Biological Products Station had its beginning in 1932 with the establishment of a Goat Virus Depot in Bombay which manufactured goat virus for the

control of rinderpest. Since then two more centres have been opened, one in Dharwar and another in Belgaum, and with the amalgamation of the Baroda State a fourth centre has also come under the control of the Government of Bombay. The Ranikhet Disease Vaccine Laboratory was established in 1947 and all these now form part of the Biological Products Institute. In spite of limited facilities, the Veterinary Department has instituted three schemes for mass immunization of cattle in certain concentrated areas. One scheme is operating in Bombay city and suburbs, the object mainly being to protect against rinderpest the city buffaloes numbering nearly 50,000. Another is working in the Pandharpur and Sangola talukas of the Sholapur district, the object being to preserve the highly bred Khillar stock against Black Quarter and Rinderpest. The third scheme is in the Satpura Hill tracts and is designed to protect against rinderpest all animals coming to the grazing areas in the Satpuras. Until recently the work of immunizing cattle used to be done by Veterinary Assistant Surgeons but, as their number is limited and they have many other duties to perform, it was decided in 1946 to institute a cheaper agency for the purpose of immunization and incidentally to carry out other minor duties falling within the province of the Veterinary Assistant Surgeons. This cheaper agency consists of stockmen. The first centre to train them was started at Bombay in 1946. Since then two more centres have been established at Dharwar and Baroda. So far 213 stockmen have been trained and it is proposed to train an additional 187. We hope that the institution of this cheaper agency will to some extent solve the difficulty regarding the staff required for the immunization of animals against contagious diseases. Artificial insemination, to which Dr. Dhakmarvala has referred, has also received attention and we have an Artificial Insemination Officer. His scheme for the creation of a centre for this purpose in Poona has been sanctioned.

Adequate control of diseases is not possible without corresponding research into their etiology. There are still many conditions of animal disease which have been noticed in this State as in the rest of the country, the exact nature of which has not been elucidated. To enable investigation, the Indian Council of Agricultural Research sanctioned in 1932 the appointment of a Disease Investigation Officer. This has been continued and an Assistant Disease Investigation Officer (Poultry) was appointed in 1941 so that he could give his exclusive attention to the problems met with in poultry. In 1946 an Assistant Disease Investigation Officer (Sheep and Goats) was appointed. To investigate the incidence of parasitic diseases, which form a group by themselves, and to devise suitable measures of control, a Parasitologist has been selected who works at the Bombay Veterinary College and also teaches parasitology to the students there. The Royal Commission on Agriculture had suggested that there should be

a veterinary dispensary for every 25,000 head of live-stock. I admit that judged by that standard the number of veterinary dispensaries in our State is inadequate. Since 1946, however, Government or Local Bodies have opened 24 new veterinary dispensaries. Government have so far taken over 31 veterinary dispensaries from Local Bodies to ensure better management. The progress, however, as regards the opening of new dispensaries and the taking over of the remaining units from Local Bodies has been hampered by inadequacy of funds and lack of staff.

An unfortunate fact about veterinary education in our State is that, despite practically free education provided by Government, students in adequate numbers are not forthcoming. Latterly, the output of the College has decreased to such an extent that the Veterinary Department is finding it increasingly difficult to carry on even its normal activities. I hope that you, gentlemen, and your Association will be good enough to pay serious attention to this deplorable situation and will undertake adequate propaganda to impress upon students the desirability of taking up veterinary work. From the brief survey which I have given I trust that you will appreciate the interest taken by the Government of Bombay in the subject with which your Associations are concerned and that you will readily afford your full co-operation to them in promoting further activities for the welfare of animals.

I now come to the various points which you, Dr. Laud, and you, Dr. Dhakmarvala, have raised in the course of your very interesting and instructive speeches. Dr. Laud has referred to rumours about the shifting of the Bombay Veterinary College to Poona, its amalgamation with the Agricultural College there and the lowering of the standard of admission from the present Inter Science B Medical Group to the Matriculation. Let me give to you the actual facts. In June 1947 Government decided to shift the College to Poona from its present site in Parel as the Veterinary College would have the advantage in Poona of being situated in more rural surroundings instead of the essentially urban conditions at the present site in Bombay. Further, the Veterinary College in Poona would be near the present Agricultural College and the two Colleges could co-operate in certain items of training, for example, dairying and animal nutrition, and the students for the Veterinary College could get instruction in fodder crop cultivation and general farming at the Agricultural College Farm. Further the clinical work of the Veterinary College, if situated in Poona, would be more closely connected with bovine animals than with equines and canines as at present in Bombay. I may say, however, that land at Poona has still to be secured and the question of constructing has also to be considered. This is likely to take at least a couple of years. Meanwhile the *status quo* will be maintained. The decision, moreover, is not irrevocable and, if necessary, Government may review the position. The proposed amalga-

mation of the Veterinary College with the College of Agriculture for the purposes of jointly conducting certain preliminary classes and bifurcation in the later finishing stages is still in the embryonic stage. No final decision has been taken. This, together with the lowering of the standard of admission to the Veterinary College from the Inter Science Examination to the Matriculation is linked with the shifting of the Veterinary College from Bombay to Poona. The question of accommodation and laboratory equipment for conducting the joint course has also to be considered.

Although the Administrative Enquiry Committee recommended that the Animal Husbandry and Veterinary Services should be placed under the control of a Joint Director of the Agricultural Department, Government has decided that the Department of Animal Husbandry and Veterinary Science should continue to remain separate so long as the post of Director of Animal Husbandry and Veterinary Science is held by Shri Laxmi Sahai.

We considered the revision of pay of Veterinary Assistant Surgeons last year and issued orders raising their scale of pay with effect from August 20, 1949, to Rs. 80-5-100-8-140-Efficiency Bar-10-200 with a selection grade of Rs. 210-10-300 for 10 per cent of the cadre. In view of the prevailing financial stringency, it is not feasible at present to consider any further upgrading of the scale of pay. Financial stringency has also prevented Government from sending any one to foreign countries for advanced training, but this question will be reconsidered with the restoration of normal conditions. The Bill relating to the registration of Veterinary Assistant Surgeons has already been drafted and is being scrutinized.

Both Dr. Laud and Dr. Dhakmarvala have referred to the desirability of setting up an All India Veterinary Council. *Prima facie* this is a good suggestion. Presumably in course of time you will submit proposals to the authorities concerned regarding the constitution and work of such a Council.

I shall now deal with the points which Dr. Dhakmarvala has raised in his speech. A pathological laboratory was established in the Bombay Veterinary College in 1886. It was used in the beginning only for diagnostic work and for training college students. Recently, however, additional staff consisting of three gazetted officers and four graduate assistants has been appointed to enable the Bacteriologist to undertake research work also and important research problems are at present being tackled in this laboratory. There can be no comparison between the Indian Veterinary Research Institute and the Bombay Veterinary College which is mainly a teaching institution and carries on research work only as a side line on important local problems. In view of the expenditure involved, we do not consider it necessary to organise different departments of the Bombay

Veterinary Research Institute. As regards the plan of mass immunization of cattle against rinderpest prepared by the Indian Veterinary Research Institute, the method of immunization against this disease adopted at present in the country consists in the vaccination of cattle with goat adapted rinderpest virus with or without serum. Sometimes bull virus is used in place of goat virus. This method of immunization has proved highly satisfactory and there have been large-scale rinderpest inoculations throughout the country. One disadvantage is that the serum cannot be kept for long once it has been issued from the laboratory. Another is that in susceptible animals it sometimes evokes a somewhat severe reaction. To overcome these defects it has been proposed lately that, in place of goat virus, we should use either the lapinised rinderpest virus or the chick passaged virus. These two vaccines have been developed abroad recently and the results obtained have been very satisfactory both as regards the immunity produced as well as safety. The difficulty so far with regard to the production of these two vaccines on a large scale has been that they require costly apparatus for their manufacture which it is not possible to obtain at present. It has been suggested, therefore, that it might be more convenient and economical to order them from abroad.

The detailed account which Dr. Dhakmarvala has given regarding the genesis and development of the All-India Veterinary Association certainly augurs well for its future. The progress which both the Bombay Veterinary Medical Association and the All-India Veterinary Medical Association have registered so far is heartening and must be welcomed by all interested in veterinary work. In this connection may, I congratulate you on the Silver Jubilee Number of the *Indian Veterinary Journal*, which is an interesting and attractive publication.

Once again I thank you for your invitation and welcome and have much pleasure in inaugurating this joint session of the 10th All-India Veterinary Conference and the 28th Annual Conference of the Bombay Veterinary Association and in wishing success to your deliberations.

JAI HIND

Dr. M. S. Sastry then requested Major Datta, the President-elect, to deliver his Presidential address and, in doing so, spoke as follows:—

Dr. S. Datta is a well known figure and scarcely needs any introduction to an audience of this kind. He is the first Indian to hold the post of the Director, Indian Veterinary Research Institute, Mukteswar, the only old established Institute of its kind in India. He has had a distinguished career. While studying for M.Sc. in chemistry at the Calcutta University, he accepted a Government of India scholarship on the advice of his Professor, the late saint scientist Sir P. C. Ray, joined the Royal College of Veterinary Surgeons, London and obtained the membership

diploma of the R.C.V.S. in 1925. On his return to India, he was appointed as a lecturer at the Bengal Veterinary College. In 1930 he joined the Indian Veterinary Research Institute as a Veterinary Research Officer. In 1938, he went abroad again for further specialised studies and took the D.T.V.M. from the Edinburgh University. He also submitted a thesis which earned for him the Degree of D.Sc., in Veterinary Science, being so far the only Indian Officer to be so qualified. He joined the Army in 1941 and served there until 1948, when he was appointed to his present post. Dr. Datta is associated with many learned bodies, being the Fellow of the Royal Society, Edinburgh, and the National Institute of Sciences of India. He was elected Vice-President of the Parasitology Section of the International Veterinary Conference held at Zurich in 1938. He has represented India in various International Conferences such as International Genetics Conference, 1939, at Edinburgh, the Rinderpest Conference of 1948 at Nairobi and the Livestock and Breeding Conference of the F.A.O. 1950, at Lucknow. He also took an active part in the Imperial Veterinary Congress in 1938.

His contributions to science are many and varied. He has diagnosed several animal diseases for the first time in India and his investigations on a group of diseases of unknown etiology—Bursati, Enzootic Bovine Haematuria, Bovine Nasal Granuloma, Lichen tropicus, to name only a few,—have been of outstanding merit and have received wide recognition.

He has now formulated plans to stamp out epizootic diseases from our country as well as to devise better feeds to our Livestock and to evolve quick methods for breed improvement. I am sure he will give us an illuminating address which will focus the attention of the nation towards the important but hereto much-neglected Livestock industry. I have great pleasure in requesting him to occupy the Presidential chair and deliver his address.

Major Datta was then garlanded by Dr. M. H. Nagamiah, Honorary Secretary of the Bombay Veterinary Medical Association. Rising amidst loud and prolonged cheers, Major Datta delivered his Presidential address in a loud and ringing tone which kept the audience spell bound. [The address of the President is printed separately at the beginning of this issue. *Ed. I.V.J.*]

Presidential address over, Dr. S. R. Chadha, proposed a vote of thanks to His Excellency the Governor for so kindly inaugurating the Conference and to the guests in responding to his invitation. With the singing of the National Anthem, by Sri R. F. Patil, the gathering adjourned for light refreshments served in the open grounds adjoining the college.

His Excellency very freely mixed with the members of the profession and the students, made very kind enquiries about the prospects of the Veterinary surgeons and expressed his grave concern that the college was not attracting students to a sufficient extent. His Excellency promised to do all that he could to improve the prospects of the profession.

With three cheers to His Excellency the first day's proceedings were brought to a close.

The Subjects Committee met under the Presidency of Major Datta during the night and considered the resolutions to be placed before the plenary session.

Second day, Wednesday, the 26th April 1950.

The whole of this day was spent in the reading of Professional Papers and their discussions. The following papers were presented :—

Is a study of our ancient veterinary literature necessary for us?—
By A. Krishnaswamy, G.M.V.C., Madras.

Rabies Control in India.—By Dr. J. R. Dogra, M.D., Haffkine Institute, Bombay.

Food Fishes of Bombay, their sources of supply, marketing etc.—By
Dr. D. S. Laud, G.B.V.C.

The role of poultry husbandry in food production.—By S. G. Iyer, Izatnagar.

Studies on Avian Leucosis complex (Fowl Paralysis).—By Capt. S. B. V. Rao, J. Das, D. R. Ramnani and S. G. Iyer, Izatnagar

The feeding of single cereals to poultry.—By D. Parthasarathy and S. G. Iyer, Izatnagar.

Combined infection of H. S. & B. Q.—By R. N. Naik, Bombay.

Research into the flora of wounds, abscesses and other inflammatory conditions in domestic animals.	} By R. N. Naik, Bombay.
Research into Mastitis of cattle.	
Research into the flora of normal udder.	
Research into Surra of horses and cattle.	

Psychic review of physiology.—By G. K. Kulkarni, Navalgund.

Contagious caprine pleuro-pneumonia. By S. L. Manjrekar, Poona.

A preliminary note on trypanosomiasis in goats.—By S. L. Manjrekar, Poona.

Retention of placenta and its treatment by homeopathy.—By Capt. G. A. Sastry, Madras.

Is Rejuvenation of a castrated goat possible.—By F. C. Bhuyan, Nowgong.

A brief sketch of the advancement of Veterinary department in Hyderabad State.—By C. Narsingh Pershad, Hyderabad.

A case of hermaphrodite in goat.—By K. V. Divekar, Nasik

A study of Neoplasms in Dogs.—By Prof. K. R. S. Aiyar, Bombay.

The President, Major Datta, gave a short resume of some of the papers whose authors were not present, and enlightened the audience with his views on the presentation of papers for the Conference.

A noteworthy feature of this day's proceedings was the extempore address of the President to the Members of the Profession in the afternoon on their duties and responsibilities. In his lucid and characteristic style, and with an earnestness and sincerity which stirred the gathering to its very depths, he appealed to his professional brethren to realise the extent of the potentialities of the profession for the development of the country and gave the clarion call to them to put forth their full efforts and improve the profession in all its aspects.

In the afternoon, Dr. S. R. Chadha, Principal, Bombay Veterinary College, provided tea for the members present.

It should here be mentioned that His Excellency Rajah Maharaj Singh, Governor of Bombay, after inaugurating the conference on the 25th April '50, announced a donation of Rs. 200/- to be spent for the welfare of the students. The announcement was received with loud acclamation.

Third day, Thursday, the 27th April 1950

The proceedings began with the reading of the following report on the working of the *Indian Veterinary Journal* by its Editor, Dr. P. Srinivasa Rao,

MR. PRESIDENT AND FRIENDS,

I have great pleasure in presenting this report on the working of the *Indian Veterinary Journal*.

In doing so, I desire to make a preliminary observation that the All-India Veterinary Association which started the *Indian Veterinary Journal* as its Official Organ 26 years ago, had not found it possible to meet during the last 13 years for various reasons (into which I need not enter at present) and consequently, it has been my proud privilege and responsibility to keep the flag of the Association flying through its Official Organ. I have tried, in my own humble way, to carry out this responsibility to the best of my ability. How far I have been successful in that task, it is for you to decide. But I would be failing in my duty if I do not at the very outset acknowledge my indebtedness to the President of the All-India Veterinary Association, Khan Saheb N. D. Dhakmarwala, for the uniform courtesy and encouragement he had extended to me all along. In spite of his advanced age and illness, he continues to take a live interest in the running of this *Journal* and gives me the benefit of his moral support. (Cheers.)

I also desire to take this opportunity of expressing my indebtedness to the late Rao Sahib K. Kylasamier who, from the very inception of the *Journal* till the moment of his untimely death, gave me unstinted help and co-operation in the conduct of the *Journal*. (Cheers.)

Many important events have taken place since we met last. The *Indian Veterinary Journal* which was started in the year 1924 had a circulation of only 340 copies and that too practically within India. Today it has a far wider circulation reaching far off countries like Australia, America, Germany, England, France, Russia, etc. It is no longer a quarterly. It is now published once in two months from July 1939. The rate of subscription for the *Journal* remained the same from the beginning for twenty five years. But, as the cost of publication was steadily mounting up almost to a breaking point, we were forced to appeal to our subscribers to accept an increased rate of subscription from July 1949. The response has, indeed, been remarkable and I am deeply grateful to the profession.

The first cycle of 25 years in the life of this *Journal* fell in July 1949 and a small Committee of our professional brethren hastened to celebrate its Silver Jubilee. The result has been the publication of the Silver Jubilee Number which has been praised beyond all measure from all parts of the world. But it has to be admitted that what has been gained in reputation has been lost in finance. That number had cost us very much and it has practically depleted our finances. We, therefore, appealed to all Provincial Governments to render us some financial help. The Director of Animal Husbandry, Madras was kind enough to recommend our case and the Government of Madras was pleased to give us a special discretionary grant of Rs. 1000/-. I cannot praise the action of the Government of Madras too highly. It has heartened me in my task very much. The replies from other Governments are yet due and I expect them to be equally favourable.

The *Journal* as usual has been espousing the cause of the profession in all its aspects. Scientific papers naturally occupied our main attention. Subjects relating to general and administrative matters also claimed our attention equally. But the latter had to be treated in an extremely guarded way. They have been dealt with in as impersonal a manner as possible but, all the same, there were occasional treading on the corns of the authorities and persons in power. I can confidently assure you that whatever is written editorially in the *Indian Veterinary Journal* is done so without the least malice towards anyone. In this connection, I would like to place before you the following remarks of Mr. T. J. Hurley, the Director of Animal Husbandry, Madras, when he presided over the Silver Jubilee Celebration of the *Indian Veterinary Journal* last July: "The *Journal* has been a critic of the Government occasionally and, although its views have not been shared by the Administration, still, it should be mentioned that its comments have been free from malice

and ill-will. In this it has set up a valuable tradition which I hope will be maintained in future years".

It is not possible in a report of this nature to detail out everything; but I hope what I have said so far is enough to give you an idea of the nature of work done by the *Indian Veterinary Journal* during the last 13 years. Two Special Numbers called the EDUCATION NUMBER and the POULTRY NUMBER were also issued and we noted that such Special Numbers were welcomed and appreciated.

In spite of the steadily increasing volume of work, I was managing with the same staff I had at the inception of the *Journal*, but, as the work was getting heavier and heavier, and as my health was not very satisfactory, the Editorial Committee met twice in 1949, considered the circumstances in all detail and was pleased to sanction an Associate in the person of Rao Bahadur R. Swaminatha Ayyar, B.A., G.M.V.C., Retired Principal of the Madras Veterinary College. I wish to record here the inestimable services rendered by him to the *Indian Veterinary Journal* all along. In taking him as an Associate Editor, the Editorial Committee gave only an official sanction to his long and continued association with me in the running of the *Journal*.

General Remarks

The success of the *Journal* is a clear indication of the vitality of our profession. It should be realised that, under the changed conditions and with the dawn of Independence, the responsibility of this *Journal* has increased a thousand-fold. With it is intertwined the name of our beloved country in the Veterinary World. May I therefore appeal to you all who have gathered here to take a live interest in this *Journal* and extend your help towards its efficiency by contributing articles and by increasing the number of subscribers?

One disturbing factor which has been weighing heavily on me is the growing accumulation of arrears of subscription for the *Journal*. The latest figures show that a sum of over Rs. 8,000/- is outstanding. This sum is a big amount for a small venture like the *Indian Veterinary Journal*. Of this sum of Rs. 8,000 nearly Rs. 4,000/- are due from Government, while the balance of Rs. 4,000 is due from private subscribers. These heavy arrears naturally throw a heavy strain on me in running the *Journal* and I earnestly beg of you all kindly to extend your co-operation to me and see that these arrears are wiped out at an early date.

Another equally disturbing factor has been the paucity of news from the various States of the Indian Union. In spite of my earnest endeavours, I must admit I have not been very successful in obtaining information from many places. You all would have noticed this omission very prominently in the special souvenir number of the Silver Jubilee of the *Indian Veterinary Journal*. This has been due not to lack of any effort on my part,

but I regret to say it, to the absence of response from my professional brethren. I request you all to consider this aspect also. In a vast country like ours, it should be easily possible to run a Veterinary periodical even on a fortnightly basis. But, as matters stand at present, even a periodical published once in two months is finding it not easy to obtain adequate material. This is a matter which must set you at thinking.

Before concluding, I wish to express my grateful thanks to that band of close associates who have been intimately connected with the *Journal* but who necessarily have to avoid the lime light of publicity. The support and co-operation I have been continuously receiving from Shri M. S. Sastry, the General Secretary of the All-India Veterinary Association, and from Rao Sahib T. Vinayaka Mudaliar, have been of immense strength to me and have sustained me in my arduous work. (Loud cheers.) I also desire to express my grateful thanks to you all, Gentlemen, for the help and patronage I have received so far at your hands and I look forward to your continued support in an ever increasing scale.

Last, but not least, I look forward to the continued support and co-operation from Major Datta, the President of this Conference. He has been a tower of strength to the *Indian Veterinary Journal* and has freely given his advice. His Institute has been one of our main contributors and I am sure he will continue this help in the future also. Jai Hind. (Prolonged cheers.)

In commending the Editor's report for adoption, the President, Major Datta, paid a handsome tribute to the Editor for the splendid way in which he has been running the *Journal* and fighting the cause of the profession for the past 26 years and he further appealed to the members to help the Editor in all possible ways, especially by taking early steps to clear off all the arrears of subscriptions. He also said that, in his travels overseas, he had found the *Indian Veterinary Journal* in the Libraries of most foreign countries and remarked that it acted as an International medium for exchange of views on Veterinary matters. As such it was their bounden duty to strengthen the hands of the Editor by contributing liberally in the shape of materials and money.

The report was adopted unanimously amidst acclamation.

The General Secretary of the All-India Veterinary Association then presented his report which ran as follows :—

Mr. President and Gentlemen,

I apologise to you for not being able to read this report personally, due to defective vision. It is the result of a developing cataract which I hope to shake off immediately on my return to Bangalore after the Conference.

The proud privilege of presenting a report which has nothing to report upon is mine and I do so with a heavy heart. It cannot be denied that the All-India Veterinary Association has not functioned to the extent to which it could

have done owing to various adverse circumstances. It has functioned mainly through its official organ, THE INDIAN VETERINARY JOURNAL, whose Editor has just now given you his report. I have tried my best to keep the flag of the Association flying aloft.

When we met last in 1936, Khan Sahab Dhakmarvala was elected President of the All-India Veterinary Association, Dr. D. S. Laud was elected as the General Secretary of the Association and myself as the Treasurer. I took over the State Exchequer of our Association from an illustrious predecessor whose name is much respected by the profession throughout India. I refer to Mr. A. Ramalinga Mudaliar, one of the founders of the All-India Veterinary Association. He now enjoys a well-earned rest in his native village close to the famous water-falls of Courtallam in the southern most district of Madras State. I am sure, but for the infirmities of age, he would have gladly attended this Conference and met his old colleagues. I take this opportunity to pay my homage to him for all his selfless services and for the great sacrifices he had undergone in the cause of our profession in my own part of the country.

Dr. Laud, after having been the General Secretary for nearly 8 years, sent in his resignation on grounds of pressure of work in other fields and the President of the All-India Veterinary Association ordered me to be in additional charge of the office of the General Secretary. So I have been in office not by your suffrage but by the pleasure of my old Revered Master, Khan Sahab Dhakmarvala. I have never been feeling happy over this situation and I now request you to relieve me from this anomalous position.

We are no more a subject nation. The free atmosphere itself has been exhilarating and is bound to do us immense good in the near future in spite of a few dark clouds here and there. But we have experienced the darkest tragedy that any new nation could be subjected to, in losing a Saint and a Seer, the Father of our Nation, who showed us the way to Freedom. Should we not as a profession reflect something of his greatness! The heritage he has left behind is the envy of all other nations. Let us cherish it in our own profession and do our duty correctly and well.

During the period under report, the work of the Association was carried on through correspondence. The Rules and Bye-laws of the Association needed revision and copies of the revised rules were sent to the Associations in the different States and to prominent members of the profession for their remarks. It is unfortunate that, except two persons, no one else has sent any replies.

The Journal Committee of the Council of the Association met twice and, taking into consideration the increasing volume of work of the Journal, decided to create a post of an Associate Editor, and requested Rao Bahadur R. Swaminatha Ayyar, B.A., G.M.V.C., Retired Principal of the Madras Veterinary College, to accept it. He was good enough to agree to the request of the Committee and I tender my thanks to him.

As usual, I have been rendering what little help I could to keep the *Indian Veterinary Journal* running. Next I have been trying to get the Diamond Jubilee Celebration of my Alma Mater, viz. the Bombay Veterinary College celebrated along with the Conference of the All-India Veterinary Association. But I have not been successful due to causes beyond my control. I cannot express adequately my feelings on this sad question and I appeal to you, my brothers, to try and celebrate the Diamond Jubilee as early as possible.

No words of praise would be too much to bestow on our able Editor for the way he has been conducting the journal with the aid of his Associate Editor. I thank them both most heartily for the same.

Gentlemen, you would all notice from the above report that the work of the All-India Veterinary Association has not been spectacular but that it has been of a very silent and sustained nature. I take this opportunity to express my grateful thanks to Khan Sahib N. D. Dhakmarvala, the President of the Association, for his unstinted support all along. Even when he was bed-ridden in the hospital with a serious fracture, he continued to maintain the correspondence with me. I tender my heartfelt thanks to the Bombay Veterinary Medical Association for having so readily invited the All-India Veterinary Association to hold its Conference for a fourth time here. It was indeed very kind and generous of them. I also wish to express my grateful thanks to Rao Sahib T. Vinayaka Mudaliar, G.M.V.C., Retired Livestock Development Officer, Madras, who, in spite of his various urgent preoccupations, readily and willingly rushed to my help and enabled me carry on the work of the Association. There are also many others who have been helping me in my work and I convey to them all my sincere thanks. May God bless you and the Association. Jai Hind.

Bombay,
27th Apr. 1950, }

M. S. SASTRY,
General Secretary.

Dr. D. S. Laud proposed the adoption of the report. The proposition was seconded by Rao Bahadur V. R. Phadke. With a few observations from the President of the Conference about the extraordinarily economic handling of the finances, the report was adopted unanimously.

Thereafter, the Conference considered the following resolutions and passed them unanimously:—

1. RESOLVED to request the Government of India to expedite the formation of an INDIAN VETERINARY COUNCIL, a statutory body similar to the Indian Medical Council, to safeguard the interests and integrity of the profession and to promote a high standard of ethics and efficiency.
2. RESOLVED to request the Governments of Bengal and Assam to raise the standard of Veterinary Education in the Veterinary Colleges of their States and get the institutions affiliated to the respective Universities at an early date.

3. RESOLVED to request the Government of India to ban completely the export of oil seeds and oil cakes which are used as cattle feed, in the general interest of the welfare of our livestock.
4. RESOLVED to request the Government of India to encourage Horse Breeding Industry in India and to instruct the State Governments not to ban racing in their respective States.
5. RESOLVED to request the Government of India and also various State Governments to designate the Departments in charge of all aspects of Livestock work as Veterinary Department instead of the present varying nomenclature.
6. RESOLVED to request the Government of India to undertake an extensive study and enquiry into the Ancient Indian Veterinary Literature with a view to their preservation (some of which are already in the varying stages of decay) and to find out how far the information contained in them may be applicable to the modern conception of Veterinary Science.
7. THIS CONFERENCE is of opinion that, on account of the importance of livestock development in India, it is imperative that Veterinarians should be nominated to the Legislature of the Centre and States. And, therefore, it humbly requests the President of the Indian Union and the Governors of the States to be pleased to appoint at least one Veterinarian to the Council of States (The Raja Sabha) and to the Legislative Councils in the States wherever they are, in consultation with the All-India Veterinary Association.
8. THIS CONFERENCE resolves that, in consonance with the Resolution No. XIII of the International Veterinary Congress, a National Committee be established by the All-India Veterinary Association to undertake the work of propaganda for the International Congress, to enrol members as well as to propose the representative of the country in the Permanent International Committee. With this object in view, this Conference requests all the State Veterinary Associations to get themselves affiliated to the All-India Veterinary Association wherever they have not done.
9. THIS CONFERENCE is of opinion that the varying standards of curriculum in the different Veterinary Colleges is not conducive to the efficiency of Veterinary Education and resolves to request the State Governments and also the Universities to which the Veterinary Colleges are affiliated to

take immediate steps to set up an uniform standard of Veterinary Education with a uniform curriculum, course of studies and designation of the Veterinary degree.

10. RESOLVED to request the Universities of the different States of the Indian Union to grant facilities to holders of Diploma of Veterinary Science irrespective of their initial qualification and course of studies to enable them to take the newly instituted University Veterinary Degree in their respective States.
11. RESOLVED that all State Governments should be requested to depute at least 3 representatives from Veterinary Department of the state, I.V.R.I., and other Institutes where Veterinarians are serving, to attend the All-India Veterinary Conference wherever it is held, in order to secure a close co-ordination and co-operation amongst the different states.
12. THIS HOUSE is of the opinion that a sub-committee be formed to consider the question of formulating a code of Veterinary Jurisprudence with Messrs. Alur and Balakrishnan as honorary convenors with powers to co-opt from different states of the Union and they be requested to publish their findings when ready.

The Conference then took up the consideration of the revised draft rules and bye-laws of the All-India Veterinary Association and resolved to refer them to a Sub Committee consisting of Drs. (1) M. S. Sastry, (2) D. S. Laud, (3) C. S. Balakrishnan, (4) Rao Sahib T. Vinayaka Mudaliar, (5) P. Srinivasa Rao and (5) Rao Bahadur R. Swaminathan.

Election of the Office-bearers was then taken up.

Dr. D. S. Laud, President of the Bombay Veterinary Medical Association, read the letter of Khan Sahib N. D. Dhakmarvala, President of the All-India Veterinary Association, regretting his inability to stand for election due to his physical disability and suggesting the election of Dr. M. S. Sastry as President in view of what the latter had done for the Association as General Secretary.

Rao Bahadur V. R. Phadke proposed the name of Dr. Datta for the President and Dr. D. S. Laud seconded it. This was greeted with loud and vociferous cheering from the entire assembly. The President, Dr. Datta, thanked the audience for this token of their confidence and wished very much he were in a position to accept it. He said that in his present official position, it would not be possible to accept the Presidentship of the Association and requested the audience kindly to excuse him. Thereupon the name of

Rao Bahadur V. R. Phadke was proposed for the Presidentship, but he declined it for personal reasons. Dr. Laud was then proposed. He too regretted his inability to accept it and proposed Rao Sahib T. Vinayaka Mudaliar's name for the Presidentship. On a technical ground that the consent of the member had not been obtained and that he was absent, the Conference did not accept the proposal. Then Dr. K. R. Alur proposed Dr. M. S. Sastry and Rao Bahadur R. Swaminathan to be the President and General Secretary respectively of the All-India Veterinary Association. This was duly seconded by Rao Bahadur V. R. Phadke. The nominees' personal disinclination to accept the honour was not accepted and the audience was in no mood to listen to their objections but carried the motion unanimously amidst loud applause.

Dr. M. S. Sastry was elected as the President and Rao Bahadur R. Swaminathan as the General Secretary of the All-India Veterinary Association.

Dr. P. Srinivasa Rao was then proposed as the Treasurer but, as he was also the Editor of the Indian Veterinary Journal, Dr. M. S. Sastry proposed Dr. A. Krishnaswamy of Madras to be the Treasurer of the Association. This was duly seconded and passed unanimously.

The Conference adjourned for lunch and assembled at 2-30 P.M., with Dr. Datta in the Chair.

Sri Murkhibhavi, Secretary of Bombay Veterinary Medical Association, presented the following report on the working of the Association.

The year 1950 had dawned a new era for our country in general and for the Veterinary profession in particular, with the birth of the Sovereign Democratic Republic of India—an event worth writing in golden letters.

The first Session of the All-India Veterinary Association in a free country is being celebrated under the presidentship of the first Indian Director of the Central Institute of the Veterinary profession—Indian Veterinary Research Institute. The function has the additional honour of having the first Indian Governor as the Chief Guest to inaugurate the Joint Session of the 10th All-India Veterinary Conference and the 28th Annual Conference of the Bombay Veterinary Medical Association.

On this occasion we have great pleasure in presenting to you the little work that the Association was able to do during the year under report.

Contrary to the traditional formality of starting the report for the year, we do not wish to begin from the date when the association was founded because we have already made a survey of the activities of the association from its birth and we have published "A short resume of the activities of the Bombay Veterinary Medical Association" from its inception in 1931 upto the beginning of this year. We, therefore, restrict ourselves to the activities mainly for the year under report.

Beginning with the resolutions passed in the last annual conference and the action taken on them, we have to mention that in regard to Resolution No. 7 dealing with the omission of the invitation to the veterinarians of this city by the authorities concerned at time of the opening ceremony of the Arey Milk colony, we have received a reply from the Milk commissioner of Bombay tendering personal apologies for the oversight.

With reference to the Resolution No. 11 regarding the rise in the pay scales of the Veterinary Assistant Surgeons, we have received orders regarding the revised scales of pay of Veterinary Assistant Surgeons, viz. Rs. 80-5-100-8-140-EB-10-200 with a selection grade of Rs. 210-10-300 for the 10% cadre with effect from August 20, 1949, Lecturers, Graduate Assistants and Hospital Surgeon Rs. 210-10-300 with effect from the same date, which is known to you all by now. We, still, however feel that the minimum start in the pay scales of the Veterinary Assistant Surgeons remains unchanged though there is a little increase in the maximum, and we further stress that continuous efforts are essential with regard to the revision of the pay scales of Veterinary Assistant Surgeons.

With reference to the Resolution No. 13 regarding the Registration of the Veterinary Graduates, the Sub-Committee appointed for the purpose urged upon the Government for the formation of the Provincial Council. We can visualise it with a happy heart that it is being almost completed as mentioned by His Excellency in his speech. It is obvious that for the formation of the Provincial Council it is necessary that the association should have the unanimous support of all the Veterinary graduates and such a support from every one of you will make the association mightier and render it capable of stressing upon the Government the urgent need for the formation of the Council. It is in this connection that an appeal was issued to the Veterinarians of the State of Bombay inviting their co-operation and support.

With reference to the Resolution No. 16. regarding stopping the Horse Racing in the State of Bombay, the Government have replied that due to the present financial stringency Horse Breeding cannot be undertaken.

With reference to the Resolution No 4 passed in the Managing Committee meeting dated 25-12-49 regarding discouraging the policy of either re-employing or giving extension to the super-annuated personnel, Government have replied that this policy has been discouraged and only in cases where highly Technical staff is not available extensions and reemployments have been granted on the recommendation of the Director.

The members of the Managing Committee had discussion with the University authorities on the subject whether any concession could be given to the Diploma holders for undertaking the Degree course and the matter is under the active consideration of the University authorities.

Realising the unfortunate and improper status of the Veterinary Science at the University, the Association has represented to the University authorities to accord proper status and representation to the Veterinary section as recommended by Principal Mudaliar of the Madras Veterinary College in his report.

With regard to the celebrations of the Joint Session, in order to have a good gathering of Veterinarians, wide publicity was given in papers in as many as 5 leading English papers and 31 vernacular papers of India. In order to give facilities for the delegates to attend the Session at half the cost in Railway fares, a very earnest effort was made by approaching the Ministry of Railways but this could not be achieved due to difficulties beyond our control.

As it is the duty of every Veterinary Organisation to help, protect and contribute towards the ever-growing pioneer Indian Veterinary Journal, the association has contributed an humble but to its maximum capacity a sum of Rs. 101- towards the Silver Jubilee of the Indian Veterinary Journal—an organ of the All-India Veterinary Association—the parent body of the provincial organisation. Shri. C. S. Balakrishnan, the member of the managing Committee, was elected to represent our association at the function of Silver Jubilee of the Indian Veterinary Journal at Madras.

Due to the merging of the States, the activities of the association have increased considerably and to keep up with the advancement of other sciences and also to safeguard and struggle for the rights of the Veterinarians we have to toil more day by day. It is not possible for any organisation to do full justice to its members and to fulfil the aims and objects for which it is born and growing unless every one of you gives your whole hearted support and nourish the organisation by your intellectual and financial help. It is up to you all to keep the association ever growing and blooming by your generosity, lack of which may make the association a body without soul.

You might as well be aware that Indian Veterinary Journal is in a very weak position so far as the financial side is concerned and we are trying to contribute our share to maintain our Journal on a high standard by trying to obtain financial aid from the Government of Bombay. In this connection, references have already been made to the Hon'ble the Chief Minister and to Hon'ble the Minister for Agriculture and Forests, Bombay.

We must mention that the deliberations of the Joint Session were exceptionally lively due to outstanding qualities and ability of Dr. Datta to whom we are all very much thankful. As has been mentioned, he is the Director of the central Institute which in a true sense is a spot of inspiration of knowledge to the Veterinarians of our country. Apart from his abilities as a prominent Research worker, he has in him the qualities, intelligence and the broad heart which are essential qualities for the Head of such a central institute. With these above qualities it appears that he has mesmerised the people over here and has undoubtedly won the heart of us all.

Nothing better would have added to the dignity and liveliness of the Joint Session than the presence of Shri. Laxmi Sahai, Director of Animal Husbandry and Veterinary Science, Bombay, and the life member of our association, but we seem to be slightly unfortunate in not having him here owing to his unexpected difficulties.

We are very much thankful to the Office-bearers of our parent body, the All India Veterinary Association, namely Shri N. D. Dhakmarvala, Shri M. S. Shastri, Shri P. Srinivasarao and Shri Swaminath Ayyar whose elderly and experienced advice and willing co-operation contributed much towards the celebration of this Joint Session.

We are greatly thankful to Principal S. R. Chadha who was ever ready with his help and advice we had throughout the year. We must mention that he always had the word "Yes" for our requests which we continuously made to him. It is not possible to mention in items the help he has given to us throughout the year.

We are equally thankful to the President Shri D. S. Laud and the members of the Managing Committee for their willing co-operation and help without which the Secretaries could do nothing.

We are thankful to Shri D. N. Khurodi for being so kind to take the delegates of the Joint Session to visit the Arey Milk Colony.

Thanks are due to Shri P. D. Havewalla, the Secretary and Treasurer of the B. S. P. C. A. Parel, for his co-operation and help.

We extend our thanks to Shri Balasaheb Raikar for installing Microphone free of charge. We will be failing in our duty if we do not thank Shri S. N. Sapre and Shri. S. G. Kshirsagar for the generosity in allowing the use of their Type-writers even at odd hours which has saved us from exhibiting our hand writing. Thanks are due to Shri. Karnik of the British Information Service for arranging an instructive film show. The idea of celebrating the Joint Session would not have anchored in our minds if we had not the confidence that our student friends of the Bombay Veterinary College would give their best to achieve the success and therefore we are very much thankful to them.

In fact we are thankful to every one of you in helping us in celebrating the Joint Session and the success is the testimony of it. In conclusion we have done our humble and sincere part as far as we could and hope that any short comings will be excused broadmindedly by you as "to err is human",

JAI HIND

G. R. MURKIBHAVI

M. H. NAGAMIA

Honorary Secretaries

Bombay Veterinary Medical Association

Bombay, }
27-4-50 }

The report was unanimously adopted by loud acclamation.

Election of the office-bearers for the Bombay Veterinary Medical Association then took place.

Dr. P. G. Date proposed Dr. V. R. Phadke be elected as the President.

This was seconded by Dr. C. S. Balakrishnan.

Carried unanimously with loud acclamation.

Dr. V. R. Phadke thanked the members in suitable terms for electing him as President unanimously.

Dr. C. S. Balakrishnan and Dr. S. R. Nadgir were elected as Hon. Secretaries unanimously.

Dr. T. R. Khaladker was elected unanimously as Treasurer.

The following were elected as members of the Managing Committee :

Drs. (1) D. R. Mudholkar, (2) N. H. Laxmeshwar (3) D. R. Chavan (4) S. N. Gadag and (5) R. H. Naick.

Lastly, the members elected Drs. G. A. Hardikar and J. P. Ghogale as Hon. auditors.

The elections over, the President rose amidst cheers, and made a few concluding observations.

He said that it would be admitted on all hands that the Conference had been an unqualified success and that, judging from the remarks of His Excellency, it had made a good impression on the Government also. He said he was very much gratified at the spirit of comradeship that prevailed among the members, more especially between the Principal and the students, and hoped that this will continue. He went on to remark that the Bombay Veterinary College had a great tradition and, now that it has been affiliated to the University, it should go on improving by availing itself of the immense advantages of its close proximity to scientific institutions like the Haffkine Institute. He exhorted his professional brethren to realise the potentialities of their profession and equip themselves properly so that they could give of their best to their motherland. Lastly, he thanked every one who had worked for the success of the conference, the Members of the Reception Committee and the Secretaries who had laboured so hard for making such fine arrangements.

Sri M. S. Sastry, the newly elected President of the All-India Veterinary Association, then spoke very feelingly about the way in which the Conference had been conducted and said amidst loud cheers that no words were adequate to thank the President of the Conference, Dr. S. Datta, for the unique manner in which he conducted the session, for his versatility, for his suavity of manners, for his resourcefulness and, above all, for his

oratory. He was firm but very gentle and he would be an ornament to any gathering, he said.

Sri M. S. Sastry then thanked Khan Saheb N. D. Dhakmarvala for his sustained interest in the profession and in the Association, in spite of all his infirmities, and wished it were possible for him to continue as its President. He thanked Dr. Laud, the Chairman of the Reception Committee and his willing team of workers for the excellent arrangements they had made and Rao Bahadur V. R. Phadke for his keen interest and participation in the proceedings of the Conference. His thanks are specially due to the Honorary Secretaries Sri Murkibhavi and Nagamiah for the hard work they had put in for the success of the Conference and the students of the College who spared no efforts to make their stay comfortable and pleasant. Special thanks were also due, he said, to Sri Chadha, the Principal of the Bombay Veterinary College, who had placed the entire College at their disposal and worked so zealously and enthusiastically with his staff for the success of this Conference. His interest in the premier institution is so intense and abiding, his love for the welfare of students is so paternal that we can all rest assured that the future of the College was safe in his hands. He then thanked all the persons who had assembled for the session from long distances and hoped that, in future years, the Conference would attract more number of Delegates from all over India. He concluded by appealing to all to extend their co-operation to him, so that, he, as their elected President, may be enabled to discharge his duties satisfactorily.

Sri A. K. Verma, Secretary, Bihar Veterinary Association, then spoke as follows:—

"As a Solitary Representative from Bihar, I have great pleasure in extending my most grateful thanks to all those, particularly my Bombay friends, both my colleagues and the would-be colleagues, who have taken so much pains in giving me all assistance, help and comforts during my short stay here to attend the A. I. V. Conference. I am no doubt most unfortunate in being quite alone here for my State but I assure you with all the forces at my command that I shall go back from here fully charged with your kind, sympathetic and affectionate electrons of hospitality accorded to me. I shall certainly carry a deep feeling of impression to my own provincial friends and I should apologise for any shortcomings on my part which you might have noticed during our short association here." Jai Hind.

Lastly a vote of thanks was proposed by Sri M. R. Redkar and in doing so he spoke as follows:—

Mr. President and Gentlemen,

It gives me indeed a very great pleasure to speak to you this evening. I stand here before you for the performance of a very pleasant duty and

that is to thank all of you on behalf of the out-going Managing Committee of the Bombay Veterinary Medical Association. You have been listening to a bewildering variety of speeches, addresses, arguments and discussions for the last three days and your brains must surely have been full of chaos and confusion but for the clear resounding voice of our worthy President Dr. Datta. I must specially thank him for having come down from the heights of Himalayas, all the way from Mukteswar, and graced this occasion at the request of the two Associations.

In his Presidential Address delivered on the first day, we heard a statement being made that the Veterinary profession lacks leadership; during the three days that followed, I made a discovery that we do not lack it any more. You will agree with me that in him we have found an able and trustworthy leader. If ever we need a representative in the Union Parliament to champion our cause, we can confidently place our destiny in his hands.

Last year, we had a great scientist in Dr. Laxmi Sahai to preside over the deliberations, this year we are more fortunate in having a person who is not only a Scientist but also a great leader. I am led to believe that it is a mere stroke of luck for us that he became a Scientist; otherwise he would have been a very successful political leader.

I hope he will kindly excuse me if I pay him a small compliment that, during the conduct of the deliberations for the last three days, he has proved himself a very able dictator in these days of misconceived democracy. He curbed down all the opposition and silenced any discordant notes so systematically and skillfully that, even those who wished to say something against, admired his irresistible manner and controversies transformed into agreements. He not only can feel the pulse of the house but can considerably change its volume and tension.

The younger Graduates will certainly draw inspiration from his talk on the great potentialities that he has pointed out and the appeal that he has made for self-help and selfless service to the cause of the country and the profession. He however revealed one fact, that he recently parted with the last of his best men from the Institute; it is surely a matter of regret for anybody to feel like that; there is no reason why anybody on earth should be considered indispensable, there is no truth in it, the world goes on without any disturbance, whatever happens to any one man on it, but it is time that our revered older generation realised a fact that no body has done his duty in his sphere unless he has trained at least one man, who will continue in his footsteps and improve upon what he has done, when time comes for him to depart.

The question hour that has been introduced this year in the Conference, was a novel idea and one wished it was extended a little.

I am sure, we all enjoyed the three days of the conference, in spite of heated discussions and bitter controversies, we shall part with sweet memories and hope to reassemble here, having developed greater affection and closer co-ordination and more perfect integration. Parting is a sweet sorrow and one has to sustain it.

I cannot merely thank in words or express our gratefulness aptly to the Madras veterans who have largely contributed to the success of this Conference.

I once again thank all of you for whatever you have done towards making this joint session a grand success.

I thank the President for Vivekanand's "perfect man" that he personified, though I cannot forget that he used a woman's cunning in avoiding to become our President for the coming year.

With the singing of National Anthem by Sri R. F. Patil and with three cheers for Dr. S. Datta, the Conference ended.

During the night a film show on Artificial Insemination and clean milk production was given through the courtesy of the British Information Service which was very much appreciated. The President of the Conference, Dr. S. Datta, thanked the exhibitors in suitable terms.

On the 28th, there was an excursion to the Aarey Milk Colony which had been planned by the Bombay Government at a cost of about 4 crores. This is a scheme which is well worth a visit by every one interested in the production of clean milk. Aarey is a small village about 25 miles from Bombay. The area round about the village has been opened out and is being dotted with a number of milk units. These 'Milk Units' are self contained blocks with hygienic stables for nearly 15,000 cows, calf pens, sterilising rooms, quarters for the staff, etc., with water and electricity laid on. There is some pasture area attached to each block so that animals have some grazing also. The milk from these blocks is collected and taken to the Central Dairy where it is pasteurised and bottled untouched by hand. From the Dairy the milk is distributed to the Bombay City through special milk vans. The scheme is only half way through its construction and it is expected that it would be completed within another year. When once it is completed it will accommodate practically all the animals now stationed in the 'congested, insanitary and disorderly stables' of Bombay.

The visitors were received by Shri D. N. Khurody, the Milk Commissioner of Bombay, and his staff and taken round the place. Shri D. N. Khurody personally explained the whole scheme to the visitors with the help of charts and maps and said that, when the scheme was completed, it would be the best of its kind not only in India but also in the whole world. The enthusiasm and keenness of Shri Khurody was evident every

where and it was his driving force and energy that has been responsible for the great progress of the scheme. Of course, as the Milk Commissioner handsomely acknowledged, the scheme would not have materialised but for the boldness and the personal influence of Sri Morarji Desai, the Home Minister of Bombay, who has been taking a live interest in the whole scheme.

The visitors had also a taste of pasteurised milk—each of them got a bottle of it—which was being obtained from Anand, about 120 miles from Bombay, for distribution to the City.

Major Datta, the President of the Conference, in thanking the Milk Commissioner and his staff, for arranging this excursion and for taking them round, paid a tribute to the initiative and resourcefulness of Shri Khurody for launching this scheme. "This milk colony has provided a bold lead and he hoped other States in India will profit by the example Bombay has set. The problems of cattle and milk improvements cannot be solved overnight but here at least a sound project is being laid on a large scale from which the whole country can learn a good deal. The colony provides added scope for educational and research facility in cattle management and control. From what we have seen for ourselves, it is clear that the Milk Colony project at Aarey will be not only an ideal for India but for the East where problems are similar." Dr. Datta concluded by wishing the scheme all success.

A visit, which was not in the programme, was the one made to the Biological Research Station, near the Bombay Veterinary College, on the 29th April 1950. Dr. Datta, accompanied by a few select persons, paid a visit to the place at the request of the Officer in charge, Dr. G.A. Hardikar, and went round the place. It was evident that the place was totally unsuited to be a biological station and it was surprising that, even in spite of that, good work was being carried on there and that it was meeting the needs of the Bombay State for its biological requirements. It was also learnt that plans and estimates were under scrutiny for the construction of ideal buildings for a Biological Station at Poona. The party spent an interesting hour there and dispersed after a sumptuous tea, with best wishes for the early fruition of the new buildings at Poona.

Names of Delegates who attended the conference.

Bombay.

Khan Saheb N. D. Dhakmarvala, Dr. S. R. Chadha, B.Sc., M.R.C.V.S., Principal, B.V.C., Rao Bahadur V. R. Phadke, G.B.V.C., Dr. D. S. Laud, Prof. K. R. S. Aiyar, Prof. J. P. Damri, Dr. S. Ram Mohan Rao, Prof. F. S. Khambata, Drs. Dhiroobhai K. Desai, S. L. Manjrekar, L. S. Hiregoudar,

S. R. Hattangady, M. R. Redkar, D. B. Khole, G. H. Joshi, S. G. Kshirsagar, D. T. Parnaik, P. R. Phadke, V. B. Kulkarni, R. M. Kalapesi, B. L. Purohit, S. J. Khambete, G. R. Murkibhavi, R. K. Raikar, M. H. Nagamia, M. K. Shangatgeri, D. R. Mudholkar, R. V. Date, M. B. Bhatwadekar, M. B. Tilak, W. A. Joshi, R. S. Joshi, M. R. Marathe, P. G. Date, G. R. Pathak, M. D. Vaishnav, V. N. Vaishnav, T. N. Vaishnav, T. G. Desai, B. B. Mundhe, Maj. D. G. Keshwani, Drs. G. K. Kulkarni, S. R. Kulkarni, S. M. Nimbalkar, V. B. Kharate, G. C. Kale, K. K. Kariappa, V. A. Kulkarni, A. G. Bhagwat, S. R. Aralikatty, V. B. Kulkarni, J. B. Kathuria, K. L. Patil, S. D. Lingayat, P. B. Umachigi, I. I. Nagamia, A. M. Munshi, S. R. Nadgir, S. G. Shurpali, S. V. Parvatikar, S. L. Deshpande, C. S. Balakrishnan, G. A. Hardikar, K. R. Alur, W. H. Patwardhan, P. R. Dhake, S. P. Phadke, N. H. Laxmeshwar, R. H. Naik, D. R. Mudholkar, J. N. Barua, N. G. Kulkarni, C. R. Sane, M. N. Ronge, V. N. Choudhury, M. S. Vyas, N. C. Buch, Capt. A. H. Potnis, Drs. T. R. Khaladkar, S. B. Hanchilikar, S. P. Deshpande, A. E. Kulkarni, R. L. Kaushal, D. R. Chavan, J. P. Ghogale, S. R. Rao, M. Puransingh, B. G. Waghmare, T. M. Choudhury, M. S. Revandikar, P. H. Abhyankar, M. Khan, R. K. Kalaswad, N. R. Adkar, A. A. Dave, V. R. Natu, C. S. Namjoshi, D. S. Tamhane, N. U. Bhide, Rao Bahadur J. N. Mankar, Drs. S. G. Bhagwat, R. G. Dharwadkar, B. A. Doerukhkar, S. N. Sapre, M. S. Salvi, Kaujalaji, Dr. Daniel, J. A. Bharuch, R. R. Tavargeri, S. N. Gadag, G. R. Kulkarni, S. B. Ghaligi, Periera, P. D. Havewalla, B. M. Pattarphod, R. K. Raikar, G. G. Chebbi, J. G. Ghogale, B. T. Chitre, V. V. Nabar, R. C. Nathani, S. S. Naik, A. A. Patrawali, R. H. Uttanwala, R. G. Sathe, D. H. Velinkar, and S. S. Patkar.

Sir Fazal Bhoy, Sheriff of Bombay and Lt. Col. J. Dogra of the Haffkine Institute, were amongst the distinguished visitors.

Mysore

Dr. M. S. Sastry,

Madras

Dr. P. Srinivasa Rao, Rao Bahadur R. Swaminathan, Dr. A. Krishnaswamy.

Madhya Bharat

Lieut. Col. M. S. Apte, Col. G. H. Mehra, Capt. M. R. Laxmanrao, Dr. K. G. Pataskar.

Hyderabad

Dr. K. S. Shetty, Dr. M. R. Reddy, Dr. K. N. Naidu.

Uttar Pradesh

Drs. L. M. Dwivedi, and N. S. Verma.

Bihar

Dr. A. K. Verma.

Rajasthan

Dr. G. S. Rathore.

The following were members of the Subjects Committee, of which Dr. Datta was the President.

Bombay

- | | |
|----------------------|----------------------------|
| 1. Dr. S. R. Chadha, | 5. Dr. C. S. Balakrishnan, |
| 2. „ D. S. Laud, | 6. „ B. B. Mundhe, |
| 3. „ V. R. Phadke, | 7. „ M. M. Murgod, |
| 4. „ K. R. Alur, | 8. „ D. H. Velankar, |

Madhya Bharat

- | | |
|-------------------------------|-------------------------|
| 9. Dr. Lt. Col. H. K. Mehra, | 12. Dr. Kaushal, |
| 10. „ Capt. M. R. Laxman Rao, | 13. „ Lt. Col. Rao Raja |
| 11. „ K. G. Pataskar, | Sardar M. S. Apte |

Hyderabad

14. Dr. K. S. Shetty,

Bihar

15. Dr. A. K. Verma,

Uttar Pradesh

- | | |
|------------------------|---------------------|
| 16. Dr. L. M. Dwivedi, | 17. Dr. N. S. Verma |
|------------------------|---------------------|

Mysore

18. Dr. M. S. Sastry,

Madras

- | | |
|---------------------------|------------------------|
| 19. Dr. P. Srinivasa Rao, | 20. Dr. R. Swaminathan |
|---------------------------|------------------------|

IMPRESSIONS OF THE JOINT SESSION

By

M. R. REDKAR, G.B.V.C., B.Sc.,

Bombay.

At last the long awaited day of the conference dawned. The Bombay Veterinary College compound and Sakarbai Hospital compound seemed suddenly awakened after a long spell of slumber; enthusiasm was bubbling every where because two great persons were expected to arrive for the conference. The first was the Governor of the State, Raja Maharaj Singh, and the second was the Director of the Indian Veterinary Research Institute, Mukteshwar, Dr. Datta.

Many more distinguished persons, scientists, journalists, leaders etc. were expected; some came and some disappointed the waiting delegates. The Hall was neatly decorated to welcome the Chief guest, the mike was

tested the secretaries of the All-India Veterinary Association and Bombay Veterinary Medical Association were seen running up and down in their zeal to see that nothing was lacking, even the Principal of College moved about anxiously to ascertain that all was well within his premises where the first All-India Veterinary Conference, after the nation's achieving freedom, was being held. The chief guest arrived accompanied by his A.D.C. and was greeted by the Presidents of the All-India Veterinary Association and Bombay Veterinary Medical Association, by the President of the joint session and members of the Reception Committee. He looked cheerful and beaming with kindly interest towards this strange little known profession. The Principal, Dr. S. K. Chadha, took him round the hospital first and then led him into the decorated hall amidst loud cheers. The conference seemed well attended, graced by the sheriff of Bombay also.

The first day's proceedings consisted of addresses by the big four viz His Excellency the Governor of Bombay, the President of Bombay Veterinary Medical Association, the President of All-India Veterinary Association and the President of the Session.

It appeared rather unusual, and indeed a matter of pleasant surprise to the poor delegates, that these usually long winding speeches were curtailed and only summary told, the entire text of the speeches was not mercilessly thrown on an unwilling audience. The chief guest answered pretty well and defended the Government Policy, it appeared that he had come prepared.

The Presidential speech as usual told of the strenuous efforts made for the progress of Veterinary Science and Veterinarians. What struck the delegates most was the speech of Dr. Datta, the President of the Joint session. The speech was a fine specimen of stark realism and direct-criticism; it urged for self help; at the same time demanded appreciation from the public; admitted the short-comings and asked for co-operation.

The second day of the conference saw the reading of Scientific papers which were many and varied. Some instructive, others informative and still others amusing, because these were read in the absence of their creators and were rather severely criticized and the delegates were left to their own imagination for clearing their doubts. The discussions on Rinderpest and Rabies brought out a fund of information and experiences from all quarters. At least one medical luminary took part in discussions on Rabies vaccine. Somehow there still seems to be a feeling of estrangement between the two professions by the conspicuous absence of the medical research workers to participate in the proceedings. The day proved interesting full of professional controversies, diverse opinions, varied experience, singular remarks and masterly summing up by the President. The third day was the day of business meetings of the All-India Veterinary

Association and Bombay Veterinary Medical Association. Herein was great enthusiasm and every one seemed to be mighty-interested in elections, the conscience of a democratic people was fully awakened. Befittingly, the old Veteran of Madras was elected as President of the All-India Veterinary Association after attempts to force the honour on Dr. Datta successfully failed. With the election of the secretary, Madras was once more voted as the centre of activities of the Veterinary world. Resolutions of all sorts were passed, the most important being the one urging the setting up of a Central Veterinary Council and Registration of Veterinary Graduates; another timely resolution came from the Principal of the Bombay Veterinary College, demanding uniformity of standards and duration in Veterinary education throughout the union. The delegates appear to have really one purpose as most of the Resolutions were passed unanimously, little storm was raised over the question of Diamond Jubilee Celebration of the Bombay Veterinary College, but it was calmed down by efforts from the chair.

The afternoon was full of sly propositions, mutual admirations and amusing annotations when office bearers of the B.V.M.A. were elected. Shri V. R. Phadke became the President and Shri Balakrishna the Secretary. Some body whispered to me that B.V.M.A. is slowly becoming P.V.M.A. with the activities transferred to the old capital—Poona. Much is hoped during the coming year of the fresh enthusiasts of the managing Committee and a former Principal as the President of the B.V.M.A. I, of course, hint at the Diamond Jubilee Celebration of the Bombay Veterinary College. The Conference ended on the fourth day with a visit to the Aarey Milk Colony—the dream of the Bombay Milk Commissioner being put into reality—the hugeness of the plan and the constructive imagination behind the project was very impressive. The cup of toned milk cheered the tired delegates as they motored back through dust and sun to the College premises.

The moment came to part, the Conference was over, it did so many things, it renewed old acquaintances, made new friendships, provided an opportunity for free discussion and exchange of thought, above all a direct contact between brothers of the profession, names only heard transformed into reality. The occasion was unique and the grandeur will remain unsurpassed for some years, the memory will not fade so easily. The delegates parted with the satisfaction that they gained something morally and professionally, the renewed vigour and inspiring thoughts would provide them company on their way back and as they bid each other "Good bye" in the heart of their hearts was a lurking desire to stay on, but the call of duty was stronger and they parted hoping that they would meet again, often, very often. Hope is immortal and the spirit indestructible.

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Editorial

THE CLARION CALL

In an outstanding and thought-provoking address, delivered in the characteristic Bengalee style of oratory, at the Joint Conference of the All-India Veterinary Association and the Bombay Veterinary Medical Association, held at Bombay in the last week of April 1950, Dr. S. Datta, the Director of the Indian Veterinary Research Institute, Mukteswar, made an earnest and fervent appeal to all Veterinarians to vitalise the activities of the profession and to make an effective contribution to the noble task of national rehabilitation. The Conference was, indeed, a historic one. Held after an interval of 13 years, mainly due to the alacrity and generosity of the Bombay Veterinary Medical Association which spared no pains to make the Joint session a great success, it revealed in an astounding degree the keenness of the members of the profession to rise up to a man to the clarion call of the President.

The head of the Bombay State, His Excellency Raja Maharaj Singh, was there to inaugurate the function. The doyens of the profession were there and Khan Saheb N. D. Dhakmarvala, the Grand Old Man of the profession, arrested the attention of every one when, in spite of his physical infirmity, he insisted on playing the role of the chief host. Their enthusiasm was catching. The flood gates of oratory that had been opened out by the President in each and everyone of his utterances during the four days of a crowded session kept the gathering keyed up to a high pitch of enthusiasm and earnestness right through. Faint hearts found fresh hopes. People who came to scoff and ridicule went away greatly disillusioned. It was really and truly a momentous session well worth all the trouble and expense involved in attending it.

The President, at the very outset, deplored the lack of public interest in our mission of livestock welfare and improvement and also the inadequacy of financial support for our activities.

Giving an impressive data to illustrate the role played by the livestock in the economy of the country and how the prosperity and well-being of the country are linked with livestock improvement, Dr. Datta remarked that the direct contribution of the livestock towards the people's purse is about 16% and that, if the income from agricultural products which are indirectly derived from these animal allies were added, the total contribution of livestock covers about two-third of the national income of the country. Comparing these figures with those derived from several industrial commodities like coal which yielded only 50-60 crores, and steel and pig-iron which yielded only 30 crores, over which, however, much money and effort are expended, Dr. Datta observed that they fall a large way behind the somewhat undeveloped and neglected Animal Husbandry of the country so far as national prosperity is concerned. He also explained in detail how Agriculture and Animal Husbandry are closely inter-related in this country and how the agricultural operations are dependent solely upon cattle for their success—a fact which those responsible for the successful working of the Grow More Food Campaign should take note of. Dr. Datta also emphasised the essential unity underlying the vast problems confronting Veterinary Husbandry workers. He deprecated the tendency to separate the problem into loose compartments of Animal Husbandry and Veterinary Science and pointed out that 'experience has repeatedly shown that wherever the problems have been separated into loose compartments of Animal Husbandry and Veterinary Science, interests have clashed and improvements retarded'. He hit the nail on the head when he concluded that, after all, an animal forms one biological entity and the idea that its evolution can be brought about by divided administrative units is irrational and unsound. We do hope that, after this convincing exposition, we will not hear any more of those queer stunts of self-interested persons about separation of livestock departments into separate compartments.

Appropriately, Dr. Datta stressed on a high standard of Veterinary Education and quoted the examples of foreign

countries where the Veterinary profession has developed into a learned profession second to none. He urged that Veterinarians must have considerable knowledge of all aspects and all branches of Veterinary husbandry and felt "happy that men of broader outlook, better scientific education and full of patriotic and missionary zeal are increasingly being attracted to the various Veterinary Colleges that have been started in this country". He, however, emphasised that 'in order to equip the students with the proper kind of knowledge, the heads of the Departments of the various Colleges should be highly equipped and experienced, and that they should be not only specialists in their own lines but should have experience in other lines as well so that proper co-ordination between the various Departments is maintained'.

Developing the subject further, the President urged on the need for enforcement of uniform high standard in all the Veterinary Colleges and pleaded for the immediate establishment of an Indian Veterinary Council, which will not only watch over the efficiency of teaching institutions but also look after the interests and integrity of the profession. The President further said that, through the medium of this Council, the Veterinarians can impress on the people the importance of their profession and thus can get the public support in money and sympathy which are necessary for building up a strong profession. We have, in these pages, been asking for the formation of an Indian Veterinary Council for well nigh quarter of a century but, for various reasons, we have not got it. It is to be hoped that, with the help of personages like Dr. Datta, the Indian Veterinary Council would soon be a *fait accompli*.

In the short time at his disposal, the President covered a wide field and touched practically on all the problems confronting the profession. He blamed the Veterinarians themselves for the apathy of the public towards them and observed that "Veterinarians have remained totally in the back ground in all scientific and cultural bodies of the country, such as the Indian Science Congress, National Institute of Science, Planning commissions,

University Grants Committee, Science Delegations etc." This plain speaking must make the members of the profession introspective and should make them bestir themselves 'to find a place in the inner Councils of policy-making in the country'. He pleaded for the expansion of the All-India Veterinary Association with an affiliated branch in every State and envisaged a time when it can join an International organisation and 'play a humanitarian role in arranging to supply the countries in the South-East Asia with their requirements in technicians'. In this connection he drew pointed attention to the directive in our constitution which runs as follows: 'The State shall endeavour to organise Agriculture and Animal Husbandry on modern and scientific lines and shall in particular take steps for preserving and improving the breeds of cattle'. The President wished, and we wholeheartedly join him in that wish, that Veterinarians of personality and leadership should take advantage of this directive and come forward and play their part in the running of the administration of the country and that the National Veterinary Association should sponsor the election of Veterinarians to the Central and State Legislatures. These are very valuable hints which must be taken up immediately by the All-India Veterinary Association for necessary action.

In these and similar ways, the President, Dr. Datta, has given, in his illuminating address, a new line of approach to vitalise the activities of our profession and, in commending his speech for close study, we appeal to our brethren to imbibe the patriotic fervour of the President and work hard for the development of our country by identifying themselves with the farmer, or, as he is often described, the common man, for making a success of his career. Dr. Datta put it very lucidly when he said that the problems as far as he (the farmer) is concerned are not the prosecution of new researches and further discoveries but the fuller application of existing knowledge adjusted to the actual conditions and systems of his life. No truer words were spoken and we earnestly wish their true import is understood and appreciated by those entrusted with administration of the country.

RABIES

By far the most important of diseases that are communicable from animals to man is Rabies, or, as it is referred in human medicine, Hydrophobia. It is a disease which is widely prevalent all over the country and dogs are the commonest of the animals affected. Thousands of people get exposed to the danger of its infection either from actual bites from affected animals or from intimate contact with the infected material. Quite a large number of persons undergo the Anti-rabic treatment and the demand for such treatment centres goes on increasing year after year. And yet, it is a matter for extreme regret that no serious thought is bestowed either to control the disease as is done in other countries, or to gather information on fundamental aspects of the disease. Reliable statistics are not available about its epidemiology, its incidence amongst the canine population etc. It was, therefore, quite opportune that, at the recently held Veterinary Conference at Bombay, Lt. Col. Dogra of the Haffkine Institute drew the attention of the members of the Veterinary profession to the serious nature of the disease and the still more serious lack of authentic information about the incidence of the disease. 'I consider rabies as principally a problem for the Veterinary Services to tackle' said Lt. Col. Dogra and drew pointed attention to the appalling neglect which this subject has received in the past in this country.

Outlining the measures indicated for the control of the disease, Col. Dogra gave the interesting information that experiments conducted at the Haffkine Institute have shown that single dose vaccination against rabies has got great potentialities as a prophylactic and concluded by saying that, while the work conducted so far may be considered encouraging, it was very necessary that other workers should take up work on similar lines.

We endorse what Col. Dogra has said on the subject and we earnestly appeal to the members of the Veterinary profession to take note of his submission that here is a sphere of activity which can most profitably be undertaken by the Veterinary Services either alone, or, in conjunction with Medical Research Institutes wherever they are. Rabies is a disease of a dangerous nature and its past neglect by the Veterinary profession should be made good by intensive work on it in the near future.

RETIREMENT

T. J. HURLEY, O.B.E., M.R.C.V.S., D.V.S.M., I.V.S.

Mr. T. J. Hurley, the Director of Animal Husbandry, Madras State retired from service on the 3rd of May 1950, after a service of nearly 30 years. He was the last of the Europeans in Veterinary service in the Madras State.

Mr. Hurley came over to India in 1922 after taking his Diploma of M.R.C.V.S. and joined the Civil Veterinary Department, Madras. For a short time he served in the mofussil and then was taken on the staff of the Madras Veterinary College as a Professor of Surgery. Subsequently he became the Principal of that College and remained as such for nearly a decade. During the term of his stewardship, the College was affiliated to the University of Madras and the Faculty of Veterinary Science was instituted. In the year 1939 he became the Director of the Veterinary Services and continued to be so till the date of his retirement. The Veterinary Services in Madras expanded quite a lot during his period, and he has been responsible for instituting a number of schemes for the combating of contagious diseases of animals and development of livestock in the State. The Livestock section was transferred to the Veterinary Department during his time and it was to the credit of Mr. Hurley that he demonstrated that the transfer was a necessary one, long over due, for the development of the livestock of the State. His services, especially during the War-time, were very much appreciated by the Government and he was rewarded with the title of O.B.E. He was also a member of the Animal Husbandry Wing of the I.C.A.R., and contributed to its discussions. Above all, Mr. Hurley will be remembered long for his great interest in the development of Veterinary Journalism. He took a live interest in the running of this *Journal* and was constantly reminding the members of the profession about the importance of recording their experience in this *Journal*. He took the criticisms made about the administration in the pages of this *Journal* in the spirit in which they were made and paid a handsome public tribute to it that its criticisms were 'free from malice and ill-will.' That gives an insight to the character of Mr. Hurley. Of a quiet and retired disposition, he carried out his duties in a dignified manner. He had a high sense of duty and whole-heartedly devoted himself to his work. By his impartial administration he had endeared himself to everyone. He has gone home to enjoy a well-earned rest and we wish him all happiness in his retirement.

On the eve of his retirement, the Editor of the *Indian Veterinary Journal*, gave an At Home party to Mr. Hurley to which a select gathering had been invited. The Editor acknowledged in handsome terms the help

rendered by Mr. Hurley to Veterinary Journalism in India and wished him *bon voyage*. Mr. Hurley was very much moved by the affectionate terms in which his services were recounted, thanked the Editor and wished him all success. He said he was carrying very happy remembrances from this country to his native home.

APPOINTMENT

Sri V. R. RAJAGOPALAN, G.M.V.C., Dip. Bact. (Manchester.)

We congratulate the Government of Madras on having secured the services of Sri V. R. Rajagopalan, G.M.V.C., Dip. Bact. (Manchester), Officer in charge of Pathology and Bacteriology Section Indian Veterinary Research Institute, Mukteswar, as the Director of Animal Husbandry, Madras, in succession to Mr. T. J. Hurley, who retired from service in May 1950.

Sri V. R. Rajagopalan is very well known to the profession not only in India but also outside. He is a Graduate of the Madras Veterinary College, having graduated in the year 1924. He immediately joined the Indian Veterinary Research Institute, Mukteswar, and has remained there all along. Beginning as a Research Assistant, he soon secured the place of an Assistant Research Officer and Lecturer in Bacteriology at the Institute. He rose to the rank of Officer-in-charge, Pathology and Bacteriology Section after having served as Research Officer in the various sub-sections of that Department. He has undergone Post-graduate training in the Department of Bacteriology at the Calcutta School of Tropical Medicine. He also holds the Diploma in Bacteriology, University of Manchester, being until recently, the only Veterinary Graduate from this country to take this Diploma.

His work at the Indian Veterinary Research Institute, has been of a very high order, wide and extensive. Sri Rajagopalan's main task at the Indian Veterinary Research Institute was to plan research schemes for the control of contagious diseases. And, apart from fundamental researches, he has been working out all the biological products issued from the Indian Veterinary Research Institute. It is due to his labours that the present Anthrax and Black-quarter vaccines are so popular in the country. We also learn he has devised a Haemorrhagic Septicaemia vaccine which is capable of conferring protection against massive test doses of cultures. He has also sponsored, we understand, a Rinderpest eradication scheme based upon the use of the latest improved vaccines.

He is a member of several scientific expert committees and has been supervising or advising a number of schemes in different provinces.

With these equipments Sri V.R. Rajagopalan must be able to contribute a good deal for the advancement of Veterinary Science in the Madras State, which is his own native province. His knowledge of local conditions must stand him in good stead and we wish him all success in his new appointment.

General Articles

RABIES CONTROL IN INDIA*

BY

J. R. DOGRA, M.D.,

Haffkine Institute, Bombay

Mr. Chairman and Gentlemen,

I consider it a great privilege to be invited to address a gathering of such distinguished veterinary men from all over India. My recent association with rabies and the great lack of interest of both medical and veterinary services in India prompted me to come here today to draw your attention to the appalling neglect which this subject has received in the past in this country. I consider rabies is principally a problem for veterinary services in India to tackle. Not only must a reasonably satisfactory method of treatment be found out, but, by health measures, incidence of rabies should be considerably reduced if not complete extermination of the disease achieved without further delay. In addition to scientific research on fundamental aspects of the subject of rabies there seems such great urgency for collection of satisfactory data with regard to incidence of disease, its epidemiology, clinical manifestations, etc.

That rabies is widely spread and significantly prevalent in India needs no discussion. Reliable statistics are not available regarding the incidence of the disease amongst the canine population of urban or rural areas in India. This information would seem to me to be the basis for any planned measures which may be undertaken at some future date.

United States, United Kingdom and some other countries have legislations enforcing quarantine of imported dogs, registration and in some countries even compulsory prophylactic vaccination of canine population. No such laws and methods for preventing the spread of the disease exist in India. A few enlightened municipalities and corporations have legislations for registration of dogs but owing to unsurmountable difficulties resulting from uncontrollable rural and urban population, their prejudices and idiosyncracies etc., the registration is neither complete nor is it possible to institute effective control measures of quarantine, muzzling or destruction of infectious animals on any large and effective scale. An extremely large canine population exists both in the urban as well as the rural areas which

* An address delivered at the Joint Session of the 10th All-India Veterinary Conference and 28th Annual Conference of the Bombay Veterinary Medical Association held in Bombay on the 26th of April, 1950.

is the main reservoir of rabies in India and is the chief source of infection to man and domestic animals, not forgetting a few wild animals, particularly the jackal.

Rabies control, of necessity, has to be a governmental campaign on a nation-wide basis and can only succeed if, in addition to legislation, there was forthcoming active assistance and co-operation of local bodies and the public. This campaign would involve registration of dogs, destruction of all unclaimed dogs, quarantine of dogs from affected areas and routine periodic prophylactic vaccination of all domestic animals particularly the dog. Whereas the former measures would require strong public opinion and progressive health organisations which, of necessity, will take time to come into force, periodic vaccination against rabies could be started without much delay. A good deal of importance is attached to this measure as it is felt that a great deal could be done to reduce the incidence of rabies if mass vaccination of dogs was undertaken by public health authorities in affected localities.

Prophylactic vaccination of dogs can be carried out with the Semple's vaccine. This method of immunization requires six injections per animal and is, therefore, cumbersome, expensive and is not a practical proposition. To make periodic prophylactic vaccination a practical proposition, it is essential that an effective *single* dose vaccination was made possible. This has been achieved with the vaccine developed at the Haffkine Institute recently (Dogra, 1949). It is a sheep brain vaccine, carbolised and incubated for one day. Eight-day old vaccines have been found inactivated. Tests carried out on the 14 and 28 day-old vaccines as a routine measure showed complete absence of live virus in all brews prepared so far.

Immunizing Properties of Canine Vaccine

Using a modification of Habel's technique described by Dogra (1948), eight batches of the vaccine have been assayed. Vaccination was effected by a single dose of 0.3 cc of 1 in 10 dilutions of the vaccine given subcutaneously to Haffkine Institute in-bred white mice 16 to 18 gm. in weight and

Serial	Batch.	50% end-point of immunized mice.	LD ₅₀ of Test Virus.	LD ₅₀ protection of Canine Vaccine.
1	513/48	10 ^{-3.38}	10 ^{-7.71}	10 4.37 = 21,380
2	700/48	10 ^{-2.50}	10 ^{-6.62}	10 4.12 = 13,180
3	724/48	10 ^{-2.75}	10 ^{-6.62}	10 3.87 = 7,413
4	752/48	10 ^{-3.66}	10 ⁻⁸	10 4.34 = 21,880
5	777/48	10 ^{-3.85}	10 ⁻⁸	10 4.15 = 14,130
6	551/49	10 ^{-4.33}	10 ⁻⁸	10 3.62 = 4,169
7	653/49	10 ^{-3.14}	10 ⁻⁷	10 3.86 = 7,244
8	40/50	10 ^{-3.84}	10 ^{-7.45}	10 3.61 = 4,074

about 4 weeks in age. LD 50 protection of the vaccine is shown in the accompanying table. It will be observed that in each case LD 50 protection was more than the minimum standard required—namely 50 per cent protection against 1000 m.l.d. of the virus. A few preliminary experiments have been carried out in dogs which showed that subcutaneous inoculation of the vaccine caused no outward signs in 18 dogs inoculated. Use of the vaccine will have to be extended much further to establish its harmlessness. In these experiments stray dogs were used and it was observed that it was necessary to use animals of approximately the same weight and age, and preferably laboratory in-bred animals. Test virus used so far was the rabbit brain fixed virus, and was given intracranially. Street virus may be used. Whereas the experiments conducted so far may be considered encouraging, they are not conclusive and it is urged that work on similar lines be undertaken by other workers in the field.

Umeno and Doi (1921) using a 20% rabbit brain carbolised vaccine used a dose of 6 cc per 15 kg. For the present the dosage recommended is somewhat similar, i.e., for dogs weighing below 10 lbs. 3cc. (single dose) those weighing between 10-30 lbs. 5cc (single dose) and those above 30 lbs. 6 cc (single dose). Further work is in hand to ascertain the optimum dose of the vaccine, and the degree and duration of immunity produced in dogs.

Keeping Qualities of the Vaccine

If stored at 5-10°C, the canine vaccine under discussion keeps fairly well. Several batches are under test. It may generally be stated that for six months most batches remained sufficiently potent and those with a higher original titre retained higher levels of potency for much longer periods. More work is required to lay down the expiry period of the vaccine. This work is in hand.

Necessity for A.R.T. Centres for Animals

Experimental work in my laboratory has very clearly shown that storage of vaccine outside cold storage conditions adversely affects the immunizing properties of the vaccine and the potency of vaccine rapidly deteriorates. The rabies vaccine, therefore, must be stored in a refrigerator. Quite a large number of veterinary surgeons, government veterinary dispensaries etc., have no such facilities. I urge that this Conference recommends as strongly as possible that such facilities be provided in all veterinary hospitals and dispensaries. There is also a great deal of lack of information regarding treatment of animals bitten by rabid or suspected rabid animals. Special training of veterinary surgeons in these matters should be insisted upon.

Treatment of Animals against Rabies

Although we recommend prophylactic treatment as well as curative treatment after an animal has been bitten by a rabid or suspected rabid animal the dosage recommended is on a purely arbitrary basis. There is ample room for study in the field. I submit that this is a sphere of activity which can most profitably be undertaken by the Veterinary Services of India alone or in conjunction with such Medical Research Institutes in India as are able to conduct this work.

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Discussion

Several questions were asked which Colonel Dogra suitably replied. The question of "culture vaccines" was discussed. Tests conducted at the Haffkine Institute showed that such batches of vaccines as were tested possessed no antigenic value. It was agreed that whereas multiple dose prophylactic vaccine conferred better immunity mass vaccination of dogs was only possible with a single dose vaccine. Dr. K. R. S. Aiyar, G.B.V.C., emphasized the importance of periodic single dose vaccine which would result in a high degree of immunity amongst the canine population of a locality, keeping clearly in mind that in the event of an animal being bitten by a rabid or suspected rapid animal it should receive a full course of treatment with Semple's Vaccine.

STUDIES ON AVIAN LEUCOSIS COMPLEX (Fowl Paralysis)*

By

Captain S. B. V. RAO, J. DAS, D. R. RAMNANI and S. G. IYER,
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Indian Veterinary Research Institute, Izatnagar, U.P.

Introduction

In India Avian Leucosis Complex, or, simply A. L. C. has been recorded in the various States but the nature of the disease is so insidious that the magnitude of the loss is hardly apparent. All the clinical manifestations are recorded since 1937, but the disease has never occurred in an epidemic form to attract much attention of the poultry farmers. For instance, in one of the big organised farms, a review of the post-mortem reports over four years shows that the visceral form of the disease was responsible for about 2 per cent of the total mortality. Scrutiny of the reports over the same period, however, brings

*Paper read at the Xth All-India Veterinary Conference and 28th Conference of B. V. M. A., 1950.

to light that the different forms of this disease were not included under avian leucosis complex. If all these cases were included, and the 'culls' probably due to this cause were also taken into account, a correct perspective of the subtle disease would become more apparent. However, unlike in U. K., the tempo of mortality is slower and a true "range paralysis" pattern of the spread has never been so far recorded in the Union.

Experimental transmission of the virus responsible for the disease is a significant characteristic of the A. L. C. and a fact of considerable value in distinguishing this condition from other neoplastic diseases. Although A.L.C. is transmissible by direct inoculation of normal birds with emulsions or filtrates of tissues containing the infective agent, it is problematic how the disease is transmitted from one bird to the other under field conditions. Although the possibility of such a transmission by contact exists, yet the proof is not fully available, nor is it possible to explain the different manifestations in the same flock at different times, and its significance.

Review of Literature

Olson (1940) in his review of literature points out that Caparini in 1896 reported the presence of fowl leucosis in Italy. Marek (1907) established the presence of fowl paralysis in nature. The spontaneous occurrence of fowl leucosis in nature was observed by Koch and Rabinowitsch (1907) and Kon (1907). Ellermann and Bang (1908) successfully transmitted the disease with a filterable agent. Since then the opinion of the workers differed as to whether a single etiologic agent is responsible for the various pathologic manifestations of the A.L.C. or whether it is different from a viral agent.

That the disease is due to heavy infestation of intestinal parasites as held by Downham and Crampton (1935) no longer holds good. Warrack and Dalling (1932) have proved that the disease may occur in entire absence of such parasites. Their view along with the views of other workers in the same line has been accepted.

That some of the nutritional deficiencies, particularly avitaminosis E, cause classical fowl paralysis, has been disproved by Blakemore (1939).

Furth (1931) successfully transmitted the disease by injecting susceptible chickens with infective whole blood or cell suspension. Fenstermacher (1936) states that the infective agent of fowl paralysis is neurotropic in nature, whereas, the infective agent of lymphocytoma is responsible for the visceral form of the disease. Patterson (1936), on the other hand, opines that the various forms of avian leucosis are the different manifestations caused by one and the same infective agent. Furth (1935) also found out that one form of transmissible avian leucosis may give rise to another form. Blakemore and Glover (1934) successfully transmitted the disease to healthy chickens with infective materials from field cases. Blakemore (1939) confirmed this finding and is of

opinion that the agent gives rise to an acute disease in young chickens, whereas, in the survivors or in older fowls it gives rise to a true lymphomatosis or paralysis.

Discovery by Blakemore (1945) of a filter passing virus as the causal agent of fowl paralysis opened a new chapter in the field of investigation. Furth (1945) states that the direct demonstration of such an agent is sometimes difficult. Burmester and Cottral (1947) have shown that different types of the disease can be produced in experimental chickens by the same filter passing infective agent. Asplin (1947) believes in the existence of two different agents in the filtrate, one giving rise to an acute disease in chickens which he terms as "chick disease" virus and which is amenable to chemotherapy and the second giving rise to the true fowl paralysis or neurolymphomatosis in older birds. Whatever the case may be, it is now an admitted fact that Avian Leucosis Complex is a virus disease and one condition of the disease may give rise to another in experimental infection.

Kaura and Iyer (1937) have reported the existence of fowl paralysis in India. Krishniengar (1937) reported the existence of neurolymphomatosis in Mysore. Other Indian workers suggested the existence of fowl paralysis in this country previously but attributed it to either helminthic infestations or nutritional deficiency. Naidu (1938) reported the occurrence of the disease again in Mysore. That the disease condition is a true lymphomatosis was established by Iyer in April 1941. Iyer and Hashmi (1945) made a survey of the disease in this country and made a histopathological study on different types of the disease in a number of birds since the first case was diagnosed. Since then the disease in its various forms has been reported from all over the country. As the reports are from the organised farms of the country who keep a stock of mostly foreign birds, the extent of infection in the indigenous breeds is little known. It is generally believed that the indigenous breeds of birds are comparatively resistant to the disease, though natural cases have been recorded in them at times. It is necessary to substantiate this belief.

Investigations have been set up on the following lines :—

1. Transmissibility of the disease in
 - (a) fairly susceptible birds,
 - (b) fairly resistant birds;
2. The spread of the disease in nature;
3. The nature of the viral agent viz. whether it is a single factor or consists of more than one;
4. A diagnostic method before the clinical symptoms are manifested.

Experimental

Chicks of Rhode Island Reds and White Leghorns from fairly susceptible strains in which the incidence of leucosis was not more than 0.5 per cent

and chicks from a resistant strain of indigenous fowls in which the disease occurred very rarely, have been selected for the study. Day-old chickens were used for experimental purposes. They were kept in isolation and their feed contained wheat bran, finely crushed yellow maize, ground nut cake meal, crushed oats and salt in the proportion of 35 : 35 : 19 : 10 : 1, to which the whole egg in the proportion of 5 per cent of the total feed was a protein supplement. In addition they were given a liberal supply of separated milk up to the eighth week. After eight weeks, along with mash and egg, a mixed grain containing coarsely crushed yellow maize, whole wheat and whole paddy in the proportion of 40, 20, 40 was gradually added to the feed. Separated milk was gradually cut down and replaced by water. Adequate quantity of greens was supplied from the second week onwards. Limestone was included in the ration after the eighth week and egg was discontinued after 24 weeks. Material for the inoculations was obtained from a White Leghorn pullet from an adjoining farm brought for post-mortem examination to the laboratory. At autopsy she showed a typical form of visceral leucosis involving liver and kidneys. On an assumption that it was a case of fowl leucosis portions of both the organs were collected for chick inoculations. Later histopathological study of the organs concerned revealed that the original donor was leucotic. A portion of the liver from the donor was triturated in sterile sand in a mortar and made into a 10 per cent suspension in distilled water of pH 7.4. This was allowed to sediment and the supernatant fluid passed through Berkefeld 'V', formed the inoculum.

Passage I.—The first batch of chicks was inoculated intraperitoneally with the filtered inoculum in 0.25 c.c. dose. This batch consisted of fifty day-old Rhode Island Red chickens.

During the next four days forty of them died which on post mortem revealed either pneumonia or coryza due to the sudden inclement weather.

Out of the ten survivors six developed the disease within 6—192 days after inoculation, in visceral, neural or ocular forms.

Passage II.—One of the chicks of Passage I was accidentally killed when 33 days old and at autopsy showed visceral lesions of leucosis in the liver and spleen microscopically confirmed at a later date. This bird served as the donor for the second passage. Liver and spleen suspension as described above was prepared and given intraperitoneally to eight of day-old Rhode Island Red chicks in 0.25 c.c. dose. Two out of them died within the next two days and two were taken away by mongoose and were scored out while the rest developed the disease, three neural form and one unilateral osteopetrotic form. All of them showed visceral form as well. In this group, the disease was observed between 5 and 205 days after the inoculation.

Contact experiment.—Along with the chickens of Passage II, three day-old White Leghorn chickens were also reared to make a preliminary study of

STUDIES ON AVIAN LEUCOSIS COMPLEX (Fowl Paralysis)



FIG. 2. OSTEOPELECTIC LYMPHOMATOSIS
(Unilateral) Passage No. ii

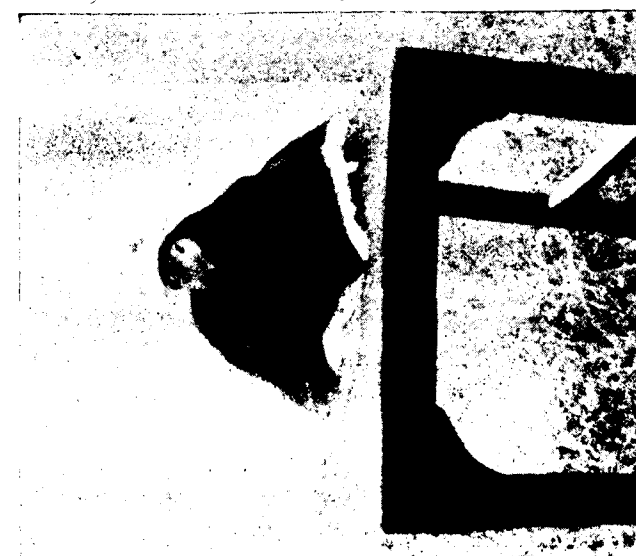


FIG. 1. NEURO-LYMPHOMATOSIS
Passage No. i

INDIAN VETERINARY RESEARCH INSTITUTE, IZATNAGAR
ADVANCE COURSE ANIMAL HUSBANDRY

1949-50



Sitting (L to R)—(O/C Class) Mr. B. M. Thakral, Mr. S. G. Iyer, Dr. N. D. Khar, Dr. S. C. A. Datta, (Director),
Dr. H. N. Ray, Dr. P. Bhattacharya, S. Balwant Singh, A. M. Khan (Rajasthan), B. N. Chaudhary (Bihar)
Standing (1st Row)—Messrs. R. R. Bodra (Bihar), P. S. Rao (Madras), M. H. Naqvi (U.P.)
A. A. Khan (U.P.), A. C. Arora (Punjab), S. R. Nandi (Bengal), M. N. Janadar (M.F.)
Standing (2nd Row)—Messrs. D. B. Mukerjee (Bengal), H. S. Jodha (Rajasthan), R. S. Singh (U.P.), B. N. Sinha (Bihar),
B. C. Dutta (Bengal)

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transmission by contact. Two out of three developed neural form of the disease between 131 and 196 days after being incontact. All were killed and autopsied. The two neural forms showed visceral as well, while in the third no macroscopic lesions were seen.

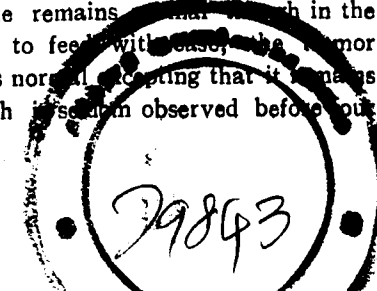
Passage III:—One of the chickens of passage II killed 30 days after the inoculation served as the donor for the 3rd lot of experimental chickens which were inoculated with visceral emulsion as indicated previously. This group consisted of twelve day-old Rhode Island Red chickens. But unfortunately coccidiosis broke out in this lot and as a result of treatment with Soluthiazole (May & Baker) six of them were saved. These were very unthrifty and showed incoordination of movement. They were killed but did not reveal any macroscopic lesion except one of the livers (so far examined) was positive for A. L. C. under microscope.

In order to continue the experiment, a second bird from the Passages II showing unilateral osteopetrosis was killed. She showed visceral lesions also. Portions of the principal organs showing macroscopic lesions were triturated in sterile sand and made into a 1 per cent suspension in sterile distilled water of pH 7.4. The emulsion was allowed to sediment for an hour. The supernatant fluid was collected and centrifuged at 3,000 r. p.m. for 20 minutes. The clear supernatant fluid was filtered through a Berkefeld 'V' candle. At the same time oxalated blood was collected, also a sample of whole blood collected and serum separated out before the bird was killed. A batch of eighteen day-old *Desi* (indigenous) chicks were taken. Eight of them received the filtrate, three were given unfiltered serum, three oxalated unfiltered plasma and four washed R. B. C. suspended in normal saline. In each case the dose was 0.5 c.c. and was intraperitoneal. One out of the lot getting the suspension filtrate died the next day, and another from the lot getting R. B. C. suspension died twelve days later and showed macroscopic lesions in liver and spleen. One of those which received organ suspension filtrate showed neuro-muscular incoordination on the 32nd day of inoculation. It apparently got over the trouble but was not growing so well as others. All of them were killed at the age of 120 days for serial passage inoculations.

In the above passages no controls were maintained as hundreds of chicks (hatched on the same dates as the experimental birds of all the passages) reared at the farm serve as controls and so far not a single case of leucosis has been reported from amongst them.

Symptoms.—The first symptom observed in the experimental birds is a tremor of head and neck and sometimes a limb or a wing. The bird remains unthrifty and keeps itself segregated. Appetite remains normal. In the case of tremor of head and neck it is unable to feed with ease, the tremor disappears after a few days and the bird looks normal excepting that it remains unthrifty. Then true paralysis starts, which is seldom observed before out

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KZ. m2, n24



months of age, as a jerky movement of one or both limbs. Within a few days the bird tries to walk on its hock and supports itself on the whole length of the shanks and the pelvis. After some days it becomes worse and lies down with fully stretched limbs. The claws are held together as though grasping a perch or is extended straight and stiff. Appetite remains normal and if well looked after it remains alive for days together. Ultimately death ensues if not killed. Pallor of comb and wattle and emaciation are other symptoms met with in almost all forms of the disease.

In the one case of osteopetrosis seen in the experimental birds, the condition started with a slight reddening of the shank. Later it disappeared and a slight convexity was noticed on the anterior aspect of the affected shank. Within a month's time this convexity increased and covered the whole length of the shank from the hock to the carpal joint. At the same time the shank was thickened more than double and from any angle, excepting the posterior view, gave a bow shaped appearance resembling very much the elephantiasis of legs in human-beings, and is well termed "Posty Legs".

In the only ocular form encountered in our experimental birds, the disease was far from the classical "pearl eye" or "fish eye" described in text books. Only one eye was affected. The whole eye ball was crystal clear with slight reddish tinge. There was absolutely no turbidity and no visible demarcation of cornea, iris and the pupil. It appeared as though the lens "had dropped out". The bird was completely blind. The other eye remained normal throughout the period of observation.

Gross pathological lesions.—In almost all the experimental birds so far autopsied the principal visceral organs affected were the liver, spleen, heart and kidneys in order. Liver and spleen were almost invariably affected. There was a slight enlargement of the liver. The surface of the organ was smooth but in some cases irregular. The border was more or less rounded. Yellowish grey spots varying in size from a pinhead to a millet were noticed throughout the organ. Sometimes they were a few and the organ was found to be covered with a thin layer of greyish gelatinous substance. In only one case the organ did not show anything beyond the irregularity of the surface.

The spleen was invariably enlarged to a marked degree with similar foci on the parenchyma. At times the capsule was found to be petechiated and adherent to the organ.

In many cases the heart showed slight enlargement with a sero-gelatinous content in the pericardial sac. Sometimes the pericardium itself was found to be thickened and in one case it was adherent to the myocardium without any pericardial fluid and could not be detached from the organ without peeling off a portion of the myocardium. In two cases a greyish yellow spot of the size of a millet was detected in the myocardium of the ventricle about 2.5 m.m. from the apex. The kidneys rarely showed greyish necrotic foci on the surface.

In the incontacts, one bird showing neural form with muscular tremor of head and neck, the cervical spinal cord looked as if it were oedematous with nodular growths at places. When examined by the help of a hand lens the normal course of the nerve fibres appeared to be distorted. In cases showing classical paralysis only discolouration at places of the affected nerve was seen.

In the same incontact bird marked thickening of the walls of proventriculus and duodenum was noticed.

The bird showing unilateral osteopetrosis presented an abnormality of the skeletal structure in that the flat bones broke to pieces when slight pressure was applied. The affected bone, on cross-section, showed a uniform structure in that the whole bone was found to be filled with faintly reddish white spongy tissue. The medullary canal, bone proper and the periosteum could not be made out with any degree of certainty. The cut surface presented the granular appearance of a wound.

The affected eye of the ocular case did not reveal any significant change on post mortem other than what is described clinically.

Histopathology.—Histopathological study made in a few experimental birds did not show any deviation from the findings of other workers.

The liver showed intravascular or perivascular infiltration or both with cells belonging to the nongranular mononuclear group of blood cells. Portal tract sometimes showed intravascular infiltration from which the infiltrating cells had invaded the adjoining tissue. Sinusoids rarely showed blood cells of various types. Necrosis at places was always detected. Destruction of liver cells and replacement by mononuclear series of cells was frequently noticed.

On the other hand, the spleen always showed an intravascular or perivascular infiltration or both with the above type of cells. The walls of small arterioles were always found to be thickened, around which fibroblasts were seen. Necrosis at places was fairly common. Subcapsular haemorrhage was occasionally seen.

The heart, when affected, showed the infiltration between the muscular fibres, with mononuclear and few other types of cells. Fibrosis of the pericardium was seen in one case where demarcation between pericardium and myocardium was not clear, and in another haemorrhage into the myocardial and endocardial tissue was seen.

Affected kidneys when examined showed similar cellular infiltration in the cortex, medulla remaining unaffected. Glomeruli, Bowman's capsule and the tubules showed no change. Distortion and destruction of kidney cells was noticed in some areas of infiltration.

In one of the incontact birds the proventriculus showed fibrosis of the serous coat and infiltration of muscular coat with mononuclear cells. The

small vessels were found to be packed with blood cells. The membrane binding the groups of proventricular glands appeared to have been somewhat thickened. At one junction of glands an area of necrosis was noticed. In the same bird the duodenum showed a similar picture of the muscular layer, while the cervical spinal cord showed no changes, excepting that the nerve fibres presented a view of irregularly interlocked hair fibres. The brain, on the other hand, showed subdural haemorrhage and cellular infiltration of the cerebral substance at places. Impaction of some of the small cerebral vessels was also noticed.

The eye of the bird suspected for the ocular form of the disease showed cellular infiltration of the choroid and the iris of the affected eye.

Decalcified bone section of the affected bone of the osteopetrotic bird showed no demarcation of the periosteum and the bone proper. Haversian canals were not clearly seen. The bone showed fibrocellular tissue and mononuclear cell infiltration at places.

No peripheral nerve so far examined could microscopically confirm the diagnosis but more section from different tracts yet remain to be checked.

Haematological findings.—Based on the finding of Blakemore (1945) that there may be a monocytosis of blood in avian leucosis complex, a preliminary study on a number of field cases and experimental birds was made. Barring a few cases where anaemia was well marked the total erythrocyte and leucocyte counts remained within the normal range. In all cases of early counts, Toisson's fluid as a diluent was used and it is felt that the thrombocytes have been counted along with erythrocytes and a few of the leucocytes were probably not included in the count, thus bringing about an error in both the counts. Later a different technique was adopted for the total counts with more satisfactory results.

In differential count made in each case using Wright's stain a slight increase of monocytes in almost all cases was noticed, except in one advanced field case where very pronounced granulocytosis was observed along with a very high total leucocytic and a very low total erythrocytic count which was diagnostic. Erythroblastosis and lymphoblastosis were found in some cases along with an increase of monocytes but it is too early to draw conclusions.

Discussion

Our findings do not deviate much from the findings of workers of other countries. Unlike the findings of Blakemore (1939 and 1945) our strain shows a marked affinity towards the spleen than towards the heart though the latter was not completely left unaffected. This may be due to strain variations.

The brittleness of the flat bones in one of the birds showing unilateral osteopetrosis may be attributed to calcium deficiency. In fact such a deficiency was found out in the analysis of the affected bone. But the mono-nuclear cell infiltration in the liver, spleen, kidney, heart and affected bone of this bird

showed lymphomatosis which argues in favour of leucosis, and that if hypocalcemia was the cause, then the deformity should be without cellular infiltration.

The peculiar type of ocular form of the disease described here could not be explained. Analysis of the liver in this case did not show avitaminosis A, nor were there lesions in the pharyngeal mucous membrane to suggest avitaminosis A.

Summary

Transmission of Avian Leucosis Complex by inoculation of infective agent and through contact is possible.

The visceral form of the disease may give rise to all other forms of the disease on inoculation into healthy chicks. Histopathological study confirmed the disease as A.L.C.

Preliminary blood study as an aid to early diagnosis of the disease indicated an increase in monocytes. Erythroblastosis and lymphoblastosis were also found.

Further studies on the subject are in progress.

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THE FEEDING OF SINGLE CEREALS TO POULTRY*

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In large scale poultry farming in this country as well as in other countries, it is the usual practice to feed a mixture of several grains and their by-products. Under village conditions, however, this system cannot be employed to any great extent, particularly in this country, as the average villager can neither procure all the various ingredients, nor does he take the pains to feed a balanced ration. In an attempt to see how far single cereals can be used in poultry feeding, dispensing with the elaborate mixtures, an experiment was conducted using *Jowar* as the *only cereal to growing chickens*. To make up the phosphorus level to that required for chickens, potassium phosphate was used. Salt also was added at 0.5 per cent level. The *Jowar* was fed in the ground form to facilitate the mixing of the supplements. To ensure that the level of protein does not fall below the optimum, separated milk was also given.

Experiment:—A total of 140 chickens, consisting of both white Leghorn and Rhode Island Red breeds were used in this experiment. The control group consisted of an equal number of chicks of the same hatch. The test group was fed on the ration consisting of ground *Jowar*, salt and the phosphate. Broken limestone was available *ad libitum*. Greens were also fed from second week onwards. To ensure that the protein level was optimum, requisite quantity of separated milk was administered partly by mixing with feed and partly by giving to drink in place of water. The control group was fed a standard ration with the usual supplements and, here also, separated milk was given as the protein supplement.

*Paper read at the Xth Conference of the All-India Veterinary Association and 28th Conference of B.V.M.A., April 1950.

It was observed that the rate of growth in the *Jowar* fed group was poor. The chicks were thin and the most striking feature of these chicks was the ruffled feathers. The ruffling of the feathers started about the 4th week and by the end of 6th week it was very conspicuous. Further it was observed that the white Leghorns appeared to be more susceptible than Rhode Island Reds as the ruffling was more prominent in their case, and started earlier. The average body weight at the end of 8 weeks of age was 8.3 oz while in the control group it was 20 oz. The mortality was normal in both groups.

While further work is necessary to find out the exact cause of the ruffled feathers, which is probably due to an amino-acid deficiency, it appears from the observations made in this experiment, that *Jowar* is *not* suitable as the *sole cereal* for feeding to growing chickens even if supplemented with the best protein supplement like separated milk.

IS A STUDY OF OUR ANCIENT VETERINARY LITERATURE NECESSARY TO US?*

By

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"In these days of far reaching advancement, every science has to welcome strangers within its gates to test and prove them whether they be true or false, and if true, to embody them in its own system, if necessary, rejecting them from that system, such parts as will no longer hold the test. If a science fails to do so and adopts a policy of isolation and withdrawal from the stream of human progress, then its power of helping humanity ceases" so said sir H. F. Knight, Adviser to the Governor of Bombay, when he declared open the Ayurvedic College in Bombay in 1941.

I respectfully call upon all Veterinary Surgeons in Republican India, if they have the slightest love for the profession, to understand the significance of the above advice and to unite in promoting, by every means in their power, the real advancement of the Veterinary Art.

Introduction:—Indeed every student aspiring to specialise in a particular art should know from what original sources the basic principles of his art have sprouted and how man in the earliest times came to know of these. This is more so in the case of the student-aspirant of medicine. It is an essential pre-requisite of every student and practitioner of the art of healing to know the primitive seeds of this art from its primitive beginning has gradually transformed

*Paper read at the Xth All-India Veterinary Conference and 28th Conference of the B.V.M.S., April, 1950.

itself into a very complex one as we know it to-day. In other words, a knowledge of the past history and development of a science is an essential prerequisite to the study and mastery of the subject.

It is indeed to be regretted that this aspect has been entirely forgotten in our present day education and that in our modern veterinary institutions all the various branches of Veterinary Science are taught to the total exclusion of its history alone, a knowledge of which forms a separate branch of Science by itself.

History of the Healing Art:—By many civilised nations of antiquity, the origin of medicine was attributed to their Gods. It was referred by the Hindus to Brahma, the Supreme creator of the universe, by the Greeks to Apollo, by the Egyptians to God Thor etc. Leaving aside for the present, the mythological aspect of the questions, we will now try to acquaint ourselves with some of the facts relating to the origin of the medical art.

With the earliest living being, the knowledge of medicine must have been purely an instinctive one. It is probable, and more reasonable also to assume, that, in the primitive age, the very instinct of self-preservation against the adverse influences of heat, cold and other manifestations of nature, and the consequent struggle for existence must have resulted in the search for protective habitation and a desire for the knowledge of the preventive and curative means of living against disease, and the hygienic measures of healthy existence. Undue exposure to uncongenial surroundings leads to the feeling of uneasy symptoms, resulting in an ardent aspiration for a knowledge of the curative methods. As necessity is always the mother of invention, primitive man exercised his powers of observation and his faculty of reasoning and must have supplemented his knowledge thus gained, by a close study of the methods indicated in what is called the "Book of Nature", i.e. by closely observing how lower animals by virtue of their instinct were able to protect themselves and get cured of certain diseases by the use of some herbs, roots, and stems of the medicinal plants etc. In the Atharva Veda, it is said that man acquired the art of medicine by observations on animals and birds. This statement lends support to the view that the mythological or Vedic aspect of this subject is only a natural outcome of the long evolutionary process and progressive development that occurred during the pre-mythological period, and that mythology is nothing but a codified and systematised form of experiences and observations of the period proceeding it.

Veterinary Science as the pioneer of all other medical science in the world.

The object of this reference to the pre-historic era is merely to reveal that veterinary science has been the pioneer of all medical sciences in the world and has played a very prominent part in the development of medical science in general. In fact, Schmiedelburg is of opinion that man has imitated animals in

detecting remedial agents. That in many instances lower animals have been the preceptors for primitive men in the matter of selection of medicines and food stuffs, is well authenticated and borne out by many historians. Pliny in his "Natural History" says that hippopotamus has been our instructor in one of the operations of surgery, viz, venesection. When this animal becomes too bulky due to continued overfeeding, it presses its body against some sharp and recently cut stem of a reed on the banks of rivers and injures a vein in the thigh. As a result of bleeding, the animal gets relief and later on covers the wound with mud. Dogs and cats lick their wounds and heal themselves. Dogs eat grass to excite vomition. Swallows heal their sore eyes by the juice of calandine. Bears cure their stomachache by eating leaves of arum. The dragon relieved itself of its vomiting sensation which affects it usually in the spring season by drinking the juice of lettuce. Elephants when they get colic have recourse to purging by eating large quantities of saline earth. Scores of such instances have been given. Thus, it will be observed how primitive men, by a close study and observations of the Book of Nature, were able to compile a science of medicine, which as a sequence of progressive evolution and development assumed a definite shape in the so called Vedas of the mythological period, and how their knowledge of the instinctive practices of animals probably formed one of the sources, from which the enormous present day medical science has developed.

The Mythological Period

Following on this period of uncoded, unimaginable and indefinite pre-mythological antiquity, we pass on to a period when all the instinctive powers of observation and imitation aided by man's own faculty of reason and discrimination were codified and regularised in the form of myths and legends.

This brings us on to the Mythological period. Philologists and Historians have been trying to find out a foundation from which they could build up their future history and have begun with the theory that the self-born Brahma with the object of guiding the world created the Vedas (four) and taught them to other Gods. From these Vedas, we come to know that the two Asvins or the sons of Sun-God became the Custodian of Atharva Veda, which is one of the four vedas which contains the treatises on medicine. Subsequent history traces the birth of Hindu surgery. Charka, the founder of Hindu medicine, Palakapya, the author of Ayurveda of elephants, and Salihotra, the author of Ayurveda of horses. There are evidences to show that these authors and their works were appreciated by other nations.

The Arabs have quoted them in their works and were in turn quoted by the Romans. Professor Deitz has discussed all these in detail in his article on the "Proofs of Antiquity of Hindu Medicine". Professor Poccock has also adduced proof to show that the ancient Romans and Greeks owed more than what is generally recognised to ancient India. As in all other branches of

Sciences, in Ancient India, Veterinary Science also was very much advanced and in the words of captain Johnston Saint of the Welcome Historical Medical Museum, "India was veritably an 'apotheosis' of the animal world and even the most irreverent layman would see (in ancient Indian medical and veterinary literature) the distinct fore-runner of all the scientific and surgical marvels of to-day. Subsequently as time went on and history came to be written, veterinary science also reached a high degree of development. Horses, elephants, cows, fish, game birds, etc., received veterinary aid. The game keeper, superintendent of forest, and the superintendent of horses and elephants each became a high officer of the Buddhist state. Under the reign of Chandragupta in 316 B.C., our modern system of bird and animal sanctuaries had been fore-stalled, and whole tracts were devoted to their preservation and care. Regulations were laid down dealing with the minutest details of the proper ration to be given to different animals at different ages, both in sickness and in health; and over their ailments was lavished a care which may well serve as an example to modern veterinarians. When Buddhism held sway, hundreds of veterinary hospitals, managed and staffed by the state veterinary doctors were set up all over India. The reports of the two celebrated visitors, Megasthenes and Arrian bear ample evidence to the above. We can still find traces of these animal hospitals in various parts of India, particularly amongst the Jains. Edicts of the Asoka, engraved on the great rocks at Jarrada in Ganjam district and in the Molak-kamuru in the Mysore Province, show evidence of the existence of well equipped veterinary hospitals. These are now under the care and management of the Indian Archaeological Department. This then was the state of Veterinary science in India at one of its most glorious epochs.

Then comes the period of what is called Modern History. Generally, so-called Modern History begins where the glory of Ancient India ends. The birth of Lord Buddha and the beneficent reign of the Great Asoka not only marked the beginning of modern times, but also the end of India Golden Age.

Writers on Indian Veterinary Science, their works and Age

The authors of work on Veterinary Science in Ancient and Medieval India can conveniently be classified under the following five periods.

1. The Vedic Period
2. The Epic Period.
3. The Puranic Period
4. The Pre-Buddhistic Period
5. The early Buddhistic and mediaeval period.

1. Under the Vedic Period when the four vedas were written comes the Atharva Veda, which is one of above four vedas, wherein information on Veterinary medicine is available.

2. During the epic period come the authentic and original authors Palakapya, Salihotra, Rajaputna, Garga, Mrigasarma, Brihaspathi, Narada, Gana, Nakula and Sahadeva.

3. Under the Puranic period come Vaisampayana and Vyasa, the author of several *puranas* wherein copious information on veterinary science is found.

4. Under the Pre-Buddhistic period come the well-known authors Jayadatta Suri, Dinapathi, Malladeva Panditha, Simhadatta, Nala, Vatsya, Sukra, Kautilya and Parasara.

5. Under the early Buddhistic and mediaeval period are the famous authors Jayadeva, King Indusena, Bhoja, Sarangadhara, Someswara, Vahada, Basavamantri, Geervana Yuddha Vikrama, Viswanath Vajpeyi, Sivamana Bhoopathi, Dipankara and poet Rudradeva.

Each one of the above authors has contributed a valuable book on Veterinary Science; but many of these works are either lost partly or completely; some are, however, still available here and there in old long standing libraries and oriental institutions where old manuscripts are collected and preserved.

Later on, with the advent of the Modern history came the Mohammadan invasion with its disastrous depredations and wholesale plunder; and during this period many of the old ancient records are reported to have been looted and burnt.

This was followed by the European invasion and the period of British supremacy. The era of British Supremacy in spite of its drawbacks was no doubt a benign one, not only on account of the complete absence of the unbearable cruelties and miseries of the Mohammadan era, but also on account of well assured freedom, safety and liberty of person and property and a well established Government looking after the welfare of the governed. But still little attention was paid to the encouragement of anything indigenous.

The little information on Indigenous Veterinary Science which survived and escaped the ravages of the Mohammadan era and lay scattered here and there in isolated places, were not allowed to be brought out but were permitted to remain sealed up in their original places of storage, so that they may have a slow and lingering death uncared for and unnoticed.

With the ascendancy of British Supremacy came also the ascendancy of Western civilisation with its inculcation of new notions and ideas in the minds of the young budding generation of India with the result that among most of the Indians educated on European lines there is a supreme indifference and inherent hatred even to think or talk of any thing indigenous. This indeed is a deplorable state of mentality not conducive to the progress of science.

With the advent of Independence and the disappearance of the British as a ruling class from India, though the glamour of western civilisation continues and the feeling of indifference and hatred towards indigenous science still persists in the minds of some, there appears to be a general awakening among many of our professional brethren to know and assess the merits or the demerits of the information available in Indian veterinary literature. Resting our hopes on this awakening we shall now try to get a glimpse of the value of information available in the surviving ancient Indian literature.

Value of the study of ancient Veterinary Literature

This may be made under the following three heads :—

1. Scientific Value
2. Economic Value and
3. Veterinary Value.

1. *Scientific Value*:—The first noticeable feature that I wish particularly to point out is that profuse information on elephants and horses and their disease and control is available and they all remain a sealed book to the lay public and to the profession at large. I may say with no fear of contradiction that the information on elephants and their diseases according to our modern concepts is practically nil at present. The only modern treatise on elephants and their diseases now in use is that of Lt. Col. G. H. Evans (1910), whose publication contains only the individual observations and experiences of the author and the treatment suggested by him on the lines adopted to other domestic animals, together with the common empirical treatment adopted by local *Mahouts*, collected and compiled by the author during his distinguished service in India, Burma and other places. In fact the author of the book, Lt. Col. G. H. Evans himself, in his preface to the book writes. "The scantiness of the literature on the subject is a source of embarrassment to those in charge of these valuable animals and the need for some guidance has been widely felt. The subject of the elephant diseases apart from its high scientific interest, has become a matter of immense economic importance". He also further regrets in his preface that his appeal for information on notes concerning elephants and their diseases met with little response. I venture to imagine that Lt. Col. G. H. Evans would not have been obliged to make this appeal for information, had he known of the existence in our Ancient manuscripts of Palakapya's *Elephantology* dealing exhaustively and exclusively on a subject, on which he felt the scantiness of literature as a source of embarrassment, and for which he made his unresponsive appeal.

Again, I may point out another instance to show this ancient Indian Veterinary Science contains information so very important to modern veterinarians. Tuberculosis is one of the major diseases commanding world-wide attention affecting both men and animals alike.

Professor J. T. Edwards in one of his articles has taken the credit for having first discovered Tuberculosis among elephants; while Lt. Col. G. H. Evans in his book on "Elephants and their diseases" claims to have discovered a case of Tuberculosis of human origin in an elephant in Hannover Veterinary School in July 1908. Notwithstanding the above claims, there are overwhelming evidences in ancient Indian literature to show that this disease was known to have been common among elephants. In the book of *Hastayurveda* or *Elephantology* which dates back to the period of the *Ramayana* epic, this disease has been dealt with in great detail in two different places viz., one under the heading of wasting diseases in chapter 9 of part I and again under the heading of wasting diseases in chapter 40 of part II. It is my desire to give you the varied remedies given in the treatment of diseases. Lack of time forbids me to do so. I may say with confidence that the information available in them is really well classified, varied and interesting.

Animal Husbandry:—Apart from the question of animal diseases and their treatments, much information on animal husbandry and general breeding operations are available. As the first and foremost measure under this head, we find that cow killing is drastically forbidden. According to Manu, Apastamba, Parasara samhitas, Kautilya's *Arthashastra*, drastic and severe punishments have been ordained for cow-killing, either wilful or otherwise. Great authors like Atri, Parasara, Gautama, etc., have laid down definite rules for the use of cattle in ploughs, showing details as to how many are to be used, how and when they are to be used, etc. The *Arthashastra* mentions a Government Officer called the Superintendent of cattle and another called the Superintendent of horses whose exclusive duties were to supervise livestock in the country, keep a census of them and see that they were properly bred and reared. The Superintendent of cattle was expected to maintain cattle census registers under the following classification:—Male calves, steers, tameable cows, draught oxen, bulls that were to be trained for the yoke, bulls kept for breeding purposes, cattle fit for slaughter, buffaloes, female calves, heifers, pregnant cows, milch kine, barren cattle of either cows or buffaloes, etc. Under fear of cattle-lifting enemies, owners sometimes kept their animals under the care of Superintendent giving the state 1/10th of the dairy produce. Castration of scrub animals was permitted and was allowed to be done only on certain days and months of the year.

Dedication of Bulls:—Dedication of bulls for breeding purposes was a great ceremony and had to be performed under certain well laid out rules and regulations. Selection and necessary qualifications of a bull for such dedication are interesting. In the *Vishnu Purana* it is said that the bull should be the offspring of a milch cow with young ones living. It should not be deficient in any limb, and it should be capable of protecting the herd. *Matsya purana* ordains that the bull should have elevated shoulders and hump, a soft and straight tail, tender cheeks, broad back, shining eyes, sharp horns and big tuft

of hair in the tail. It must be well built, with a roar like thunder, high in stature, and walking majestically like an infuriated elephant. In the Mahabharatha, cattle census and pedigree registers are described. All these show that the ancient Indians were very particular about the general confirmation and physical fitness of the breeding bulls. The Arthasashtra mentions that every herd of 10 heads of cows or buffaloes should include 4 bulls. Particulars of the time of service have also been well described.

Genetics:—In the field of Genetics, the science of conception, the parental disposition, the possible potentialities of progenital inheritance from the father and mother, the antenatal and postnatal care of animals are all well explained. Under the heading of Traits of Inheritance, much information is available in ancient literature. The Science of Gynaecology and genetics is dealt with in some detail. It is mentioned therein that the elements of hair of the head and body, beard and moustaches, bones, nails and teeth, blood vessels and nerves, and all structures that go to form sturdy and hard substances of the body are derived from the father, while the elements of flesh and blood, fat and marrow, heart and lungs, the alimentary canal, liver, spleen, pancreas, kidneys, and bladder and all structures that go to form the soft parts of the body are derived from the mother. This is so far as the concrete parts and strength, of the body go; mental development and all other psychological manifestations are derived by the infant from the endocrine system of the parents. In fact they are the admixtures of the developed manifestations of the endocrine glands of the parents at the time of fecundation.

Livestock feeding:—The manner in which the stock were fed was most important; because the breeds depended primarily upon the feed. Elaborate prescriptions regarding the nature and the amount of ration that a bull or a cow or a buffalo should receive have been given.

Dairy Farming:—Every village had its own pasture lands and forest lands. Common rights in pastures and forestry were important and recognized by the state. In the Arthasastra, the King had been directed to set apart pasture lands in uncultivated tracts. In the Manu Samhita, it is enjoined that on all sides of a village, a space about 100 *dhanus* in extent should be reserved for pasture and thrice that space round a town. In all Royal grants of villages special provisions were always made for them. The cattle were allowed to graze freely in those pasture lands, and forest lands supplied fuel to the people who, saved much of the cowdung for manurial purposes.

Fodder for Cattle:—Cultivated lands were available for grazing after the crops had been harvested. The weeds on cultivated lands, the plants growing up from the seeds falling both before and during the harvest, the stumps of crops and grass on the field borders and along waterchannels were made available for the cattle. The cultivation of fodder crops and their conversion into silage was

a process known to the earliest Indians, as suggested by the word *sujavas* which occurs in the Rig Veda.

Another interesting point in this connection is that the nutritive value of standard milk had also been assessed. One *drona* of cow's milk was known to yield one *prastha* of butter, and that of buffalo milk one seventh *prastha* more. In the Arthasashtra, it is said that the increase in the yield of milk and butter depends upon the nature of the soil, the quality and the quantity of fodder and water allowed. It is advocated that to increase the supply of milk the cow should be given daily a few morsels composed of several sticks of Asvagandha (*physalis flexosa*) and sesame seeds.

Other points of general veterinary interest:—

1. In the case of horses, colour pigmentation, physical conformation and the nature of volition in relation to the temperamental qualities of animals (i.e. to find out if an animal is good or bad tempered by its colour, confirmation, and voice) have been described.

2. In the case of cows, colour pigmentation in relation to the nutritive value of its milk is given. Thus the milk of a black cow is considered most nutritious. The milk of a red cow comes next and that of a white cow is least nutritious. Modern research scholars have recently found this to be true.

3. In a book called Sivatatva Ratnakara by Basavamantri, we find all useful information about fowls. Cock fighting, their colour, form, gait etc., as an index to their fighting capacity are well described. In the same book, much information is found about the keeping of sheep, goats, dogs, serpents etc.

4. In the famous book called Sukraniti much interesting information on what is called standard conformation of an animal, the detailed measurements of all limbs of a standard animal, the proportion of the various limbs of the body in relation to each other and to the whole body in general etc, are well explained.

5. The various breeds of horses in India, about 54 in number, with their clear and detailed descriptions and characteristics and their regional distribution and qualities of the breeds have been given in detail. True to the descriptions given are found tricoloured diagrams drawn by expert artists in the court of King Sarfoji of the Maharatta Dynasty. Same is the case with elephants also. These two manuscripts of horses and elephants have been very much appreciated by one and all of the distinguished visitors to the Saraswathi Mahal Library, Tanjore, including successive Governors, Viceroys, and many American and other foreign tourists. Cannot true copies of these tricoloured diagrams with their respective characteristic descriptions given under each diagram be obtained and made to adorn the walls of the several veterinary colleges in India, as well as the offices of the Director of I. V. R. I and the A. H. C., I. C. A. R? It is for our professional brethren to answer.

6. Handling of animals and securing them for operational purpose are some of the most important duties of veterinarians. In the case of large animals like elephants, they are problematic. Many of us may have come across and seen some Mahouts being able to efficiently control even very restive animals. How is this done? The methods of approaching them and handling them have been given in ancient literature. In this connection, the portion that is of scientific interest is that there are what are called vital parts of the animal's body, 107 in number, probably important nerve centres. Mere touching and beating them in these parts are likely to produce shyness or excruciating pain and bring the animals under control. In many parts of Malabar, Travancore, and Cochin where there are reputed hereditary elephant doctors, there are bronze models of elephants made and the vital parts located therein with small round holes drilled and also a copy of the manuscript literature with them. It is but essential that we, veterinarians, who are often times called upon to attend upon these animals must know something of these vital parts and their details.

These are some of the many important topics found in ancient literature on the scientific aspect.

Economic Value:—The economic value of a study of indigenous drugs may be assessed under the following 2 heads:—

1. It will make India self-supporting by utilising indigenous drugs as far as possible in the place of imported ones and will bring about a careful and planned exploitation of the enormous crude drug resources of India to find out and manufacture remedies which will replace the existing costly imported remedies. Examples of such possible useful exploitation of crude drugs may be found in *Crinum defixum* and *Calatropis Gigantica*, *Colchicum luteum*, *Scilla Indica*, *Ferrula narthex*, *Gentiana radix*, Camphor etc. There can be no doubt that if all the indigenous drugs were exploited and used in this country in the same way in which they are done in foreign countries, it will not only save the drain of these raw materials from this country and prevent us from taking the finished products at considerably higher prices, but will also open a large field for the development of indigenous drug industries.

2. The economic value of the study of indigenous drugs will be apparent if we know that the drugs mentioned in the indigenous literature are only of local origin and will be within the easy reach of the great masses whose economic condition is very poor and the far off interior villages where the modern treatment cannot reach.

A great many ailments of every day practice are only of a minor nature and can be treated with crude drugs ordinarily available in the bazaars locally. This is more so in Veterinary practice. Many of these local drugs, if judiciously used, will be nearly as efficacious as the most up-to-date refined products, and bring down the cost of treatment to the minimum. In every branch of pharma-

ceutical preparations such as purgatives, anthelmintics, carminatives, expectorants etc., equally effective crude drugs are available and can be substituted with maximum efficiency and minimum expenditure.

The following are some of the factors to be considered in favour of using crude drugs:—

Firstly, it is a matter of common knowledge that herbs or plants taken from the field are most effective in their actions; next come those that are dried, preserved and made available in the local bazaars; and lastly come those wherefrom extracts are prepared and preserved in alcohol or other preservatives.

Secondly, according to indigenous pharmacopoeia, the different parts of plants such as bark of roots, bark of stem, leaves, flower seeds, unripe fruits and ripe fruits are said to possess different properties, always not akin to each other. In the case of *Aegle marmelos*, the root bark is a cardiac tonic, the leaves are bitter and pungent, the unripe and half-ripe fruits and their rind are astringent, the ripe fruits are aromatic, cooling, laxative and demulcent etc. This is the case with most of the plants. Hence in the use of crude drugs there is the advantage of using the particular part of the plant which is specially indicated in the ailment.

Thirdly, it is found that most of the crude drugs contain more than one alkaloid in them. Many medical men are of opinion that the sum total of all the alkaloids present in a crude drug is as efficient as the individual alkaloid in the treatment of a particular ailment, and as such, the drug itself can be employed instead of its particular alkaloid; for example cinchona bark with the total alkaloids therein has been found to be as efficient in malaria as its individual alkaloid *Quinine* or *Quinidine*; and *Ipecacuanha* with all its alkaloids therein is found as efficient in the treatment of amoebiasis as pure emetin. Again, tincture of *Ephedra vulgaris* is as effective in asthma as its alkaloid Ephedrine. On the other hand, there is also another view that, in some cases, the total alkaloids present in a drug act better than its individual alkaloids; for example it has been found that, in the case of *Hollarrhena antidysenterica*, the whole drug acts better than its alkaloid either conessine or Hollarrhenin. This shows that the use of *crude drug* is better than its alkaloid.

Fourthly, in cases where there are a number of alkaloids in a drug and where such alkaloids have properties either similar to, or varying from one another, it is always possible that each alkaloid acts either as an adjuvant, or as a mitigant or corrective to the other alkaloids, with the result that the whole drug can be administered in larger and safer doses than its individual alkaloids which have to be used with great care and

caution in view of their precipitate action and possible toxicity. It is, however, but right to say, that, in an urgent case, the alkaloids alone are indicated, in view of their immediate action and possible relief.

Fifthly, crude drugs received fresh from the field, if available, are always considered the best for their efficient action. According to the British Pharmaceutical Codex, the process of drying of gentiana roots may have a marked effect on their ultimate composition. Gentiopicrotin, the active principle present in fresh gentiana lutea roots, is likely to be hydrolysed during slow drying by fermentative changes with consequent diminution of water soluble substances. It is, therefore, possible that there may be absence of gentio-picrotin and lack of aqueous extractives in the dry root. There are no reasons to contradict as to why this should not be the case with the other drugs also. Fresh crude drugs are therefore always considered preferable for use.

It is thus seen that these are the several factors favouring the administration of crude drugs. Of course, it should be possible for us to use these drugs either as powders, decoctions, infusions, pills, boluses or electuaries as circumstances warrant and bring down the cost of treatment to the lowest possible minimum. The drug resources of this country are vast and immense and it may not be an exaggeration to say that, with its planned research and drug industrialisation, India can not only make itself self-sufficient, but also supply the whole world with its medicinal herbs and proprietary preparations.

Veterinary Value:—It has already been observed in the previous paragraph that a great many ailments of every day practice are only of a minor nature, which can be treated with ordinary locally available drugs and that many of such drugs, if judiciously used, will be as efficacious as the most up-to-date refined products. My study and work in this particular branch of veterinary science has convinced me of my above observations and my experience in the Indigenous drugs scheme of the I. C. A. R. working in the Madras Medical College has further confirmed that investigation on modern lines if conducted on the drugs and treatment mentioned in Indigenous Veterinary Literature will lead to results which, in many cases, will not only be encouraging but also be revolutionising the veterinary and medical world. As an example of this, I may mention that a preliminary study of *Calatropis gigantea*, a much neglected plant wildly grown throughout India, on which not much work appears to have been done by other research workers, has yielded very encouraging results. An active crystalline principle, which we have for the time being designated as Calatropin, obtained from the milk juice of the plant has been found to have not only well pronounced lasting pressor action upon the heart, but in two experimental cases found to revive the dead heart

and to make it work again for long hours together. As a pressor agent of the failing heart, this is likely to prove as efficient as, if not more than, either Adrenalin or Coramine. From the feeding experiment carried out, the leaf and flowers and bark powder of this plant was found to act as a good tonic for ruminants.

Another indigenous plant by name *Crinum deflexum* has been found to be a very good substitute for *Digitalis*.

A medicated oil and paste prepared from the green juice of *Datura* leaves has been found to be an infallible remedy for indolent ulcers and wounds.

The paste of the leaves of a plant called *Brahma Rakshas* given internally and applied externally, was reported to be very effective in cancerous growths of the horn and eye.

These are only a few of the many plants and herbs found to be efficacious remedies and deserve to be investigated on modern lines.

The veterinary value of a study of Indigenous veterinary literature can therefore never be questioned.

Conclusion:—Enough has been said on the subject. At present, while there is a consensus of opinion even among educated Indians that no benefit will be derived by a study of the old systems of medicine which are based on empiricisms, rather than science, the Indian systems of medicine have been regarded by many of the western scholars like Wise, Ainslie, Roxburgh, Hooper, Dymock, Captain C. J. Saint, etc., as a rich mine of knowledge from which many useful things might possibly be unearthed. They have expressed the belief that any system of medicine, or for that matter, any ancient usage or custom that has held its own for generations, usually has something at the back of it, no matter how little it appears to be supported by modern science.

The late Lord Hardinge, during the period of his Viceroyalty, in the course of an address once said "when I remember how many millions of people in India are beyond the reach of allopathic aid provided by the Government and how many of those who had means of access to consult the best doctors still prefer to be treated in accordance with the *indigenous system* of medicine, I come to the conclusion that I should be wrong to discourage the scheme which aims at improvement and development of this branch of medicine".

One thing is clear. God has not created the 400 millions of people and nearly one third of the world total cattle population in India, with remedies for all their ailments somewhere outside India. And history shows that India has never before been so despicably dependent upon foreign

medicaments as now, even for its everyday requirements. This is mostly due to the scant disregard and abject apathy of the allopathic practitioners of to-day and the lay public as well, towards anything indigenous. The one reasonable attitude of the modern professionals ought to be one of appreciation of what they have learnt in allopathic medicine, and at the same time, an ardent aspiration and application to know if there is anything equally efficient in indigenous medicine. To throw off a thing without first of all knowing what it contains is not a healthy sign of a progressive science or a successful practitioner.

In the *Hindu* dated 4th March 1946 we find the following :—

"American scientists are planning a number of expeditions to different parts of the world to find out something more about the herb medicines of primitive peoples. In these days of advanced scientific knowledge, chemists are increasingly aware of the part that old time native remedies may play in new medical discoveries. One of the reasons for the renewed interest in herb medicine is the realisation of the value of vegetable matter in the battle against disease. Such discoveries as penicillin, and strepto-mycin have proved that modern essential drugs are yielded by the same processes that produced the vegetable cures of our distant ancestors".

Comment is needless. One has only to understand where we, Indians, are and where the Americans are in the matter of furtherance of research. If there be one thing more than another that must stir the patriotic Indian Veterinarian, it should indeed be an yearning and an unquenching thirst for a knowledge of the herbal cure of India's yore of which one hears more in its ancient Veterinary lore.

FOOD FISHES OF BOMBAY, THEIR SOURCES OF SUPPLY, MARKETING AND THEIR MODE OF INSPECTION AS TO WHOLESOMENESS Etc.*

By

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Fish, from time immemorial, has been considered to be an important article in the dietary of human beings, particularly the non-vegetarian class. It has found great favour with the population living along the coast line. Government have on account of difficulty in the procurement of the staple food grains recommend fish as a subsidiary food.

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2. Early History

In years long past, Bombay was a fishermen's village. The early inhabitants were fisher-folk, locally known as 'Kolis', who plied their fishing trade in and around Bombay. These Kolis are all Hindus (Maharashtrians) and their language is Marathi which they speak in a corrupt way. During the early Portuguese period, many of them were converted to Christianity. But they still maintain their old traditions, heritage, customs, manners and language. Bombay was given in dowry by the King of Portugal to his daughter Princess Katherine of Braganza at her marriage with Charles II, King of England (1660-1685). Since then, Bombay changed hands and came under the sovereignty of the British. From thence onwards, Bombay has made rapid progress and advancement in the field of Education, Science, Trade, Finance, Commerce, Industry etc. and Bombay is now a great city in the East (*Urbs Prima in Indis*) and is the Gate-Way to India. Even now the colonies of Koli community are found in Colaba, Carnac Bridge, Mzagaon, Sewri, Sion, Dharavi, Worli in the city proper and at Bandra, Danda, Juhu, Versova in Salsette now included in greater Bombay; and Virar, Thana, Bassien, Utan, Agashi all along the sea coast in Thana and Bassien Talukas of Thana District, and Alibag Uran etc. in the Kolaba Collectorate.

3. Duties of the market staff

One of the principal duties of the market staff under the superintendent of the Bombay municipal markets and slaughter houses is the inspection of the fish as to its wholesomeness, in addition to other food stuffs such as Meat, Fruits and Vegetables, Poultry and Eggs, Provisions and other foodstuffs sold in the various markets of the city. These form the daily routine of the market department from the point of sanitation and public health.

4. Fish supply and sources

Fish is widely sold in Bombay markets. The local fishermen or *Kolis* bring in their catches from such of the local ports as Choupati, Colaba near Aurthur Bunder, Carnac Bunder, Worli, Mzagaon, Sewri, Sion, Dharavi and from Danda near Bandra, and Virar, Palghar, Agashi, Utan, Bassien and Uran in Thana and Kolaba Collectrates. Fish is also imported from Janjira, Malwan, Vengurla along the sea coast in Ratnagiri District and Karwar and far distant Mangalore in motor launches, which are provided by the Bombay Government Fisheries Department and private enterprise.

The market price of the fish varies according to size and quality. It is higher during the monsoon when the local supply is limited. Supplies, packed in ice, are then imported by rail from Bilimora, Broach, Div, Demau,

and other coastal towns in Gujraht and by sea from Junagad and Veraval in Kathiawar (Saurashtra). Fish in monsoon used to be like-wise imported from Karachi, but the trade is stopped after the partition of India. The local supply during the fair season is more plentiful during the *Udhan*, or high tide, than at *Bhang* or low tide. *Udhan* and *Bhang* occur twice a month lasting for 11 and 4 days respectively.

5. Treatment of fish

The treatment of fish after it is caught has improved since last few years. Formerly, only salt water was used to keep the fish fresh but, at present, fishermen use ice to prevent the fish getting tainted. They also now take the advantage of keeping fish in a refrigerator after its transportation to the markets. Ice chests were formerly used by the fishermen for storing fish overnight but, in the Crawford Market, they place their stock in the cold storage plant which is provided in this market for storing marketable commodities; so also in the cold storage and ice plants owned by the private enterprise in the city.

Fish is never gutted nor cleaned on board, but the larger kinds are gutted immediately they reach the shore.

6. Use of by-products

There is a great market for the fish guts, the swim bladders (maws) are extensively collected along the coast of India and exported to China and Europe for the manufacture of Icing Glass. Large business is done in shark fins, which are removed, dried and exported to China for manufacture of glue. Fish manure is also highly prized and is extensively used in horticultural and agricultural operations on account of the nitrogen and phosphates it contains, and for this purpose small fry like sardines, shrimps etc, are thrown merely on the sand to rot and dry under the action of the sun and then converted into *Kuta*, or dry fish manure, or fish meal.

A certain amount of crude fish oil is extracted by the fishermen from the livers of sharks and sardines and all the oil that is extracted is used by the fishermen for domestic use. The prospects of developing this industry are not bright as is the case in Madras, for the oil sardines (the chief source of oil) do not visit the Bombay waters regularly or in sufficient numbers. However, the Government Technological Laboratories of the Bombay Fisheries Department have already started the manufacture of the Shark Liver oil extracted from the liver of sharks which is rich in Vitamin A-D. It has been in great demand since the World War II as substitute for cod liver oil. The Laboratories also have been manufacturing Elasmín (Liquid and Pearls) in concentrated form from the Shark Liver Oil. Both contain Vitamins A and D and are quite palatable and easily digestible.

7. Preservation of the fish

The object aimed in the preservation of fish is to prevent its putrefaction. During life, the blood and the flesh of healthy animals are entirely free from bacteria though the contents of the digestive tract abound in them. In health, and before death, these microbes have no power to penetrate the intestinal walls, but, immediately after death, they rapidly swarm into the tissues from the intestine or from the air and the surroundings. To prevent this from happening, the following processes are carried out in the preservation of fish:—(1) gutting and cleaning (2) refrigerating and sterilising (3) curing and canning. If these three processes are thoroughly and rapidly carried out, bacteria may be prevented from tainting for an indefinite period. Unfortunately, from the point of view of food inspection, the conditions in the tropical climate militate against the speedy and complete processes of these essentials—the heat which provides optimum temperature for the growth of bacteria, the moisture of the sea coast which is equally favourable to such growth and unfavourable to desiccation or drying etc. The methods of preservation are as under. It is a very lengthy subject and the time limit factor will preclude me from enlarging and going into the details of the several methods of preservation. However, I shall confine myself to general remarks and a few important details.

First method is obviously to prevent death, or in other words, to keep fish alive after being caught. This is not a method of curing but may be treated as a preliminary precaution.

Second is that of refrigeration.

Third is desiccation or drying with or without salt.

Fourth is the use of antiseptic preservatives, such as salt, smoke, vinegar, boric acid etc, and of miscellaneous processes.

Fifth is sterilisation which is accompanied or immediately followed by the exclusion of air to prevent the further access of bacteria *viz.* by hermetically sealing. Canning is the best example of this method.

(1) Keeping fish alive is the best method of preservation from getting the fish tainted before gutting or curing. It is far more largely used in European countries. There are two ways of keeping fish alive:—

(A) In or with the fishing boat from the moment the fish is caught till brought to the shore either in 'Live Wells' or 'Live Cars'; the former is a compartment in the fishing vessel itself.

and the latter, a separate boat or cage towed after the fishing boats. The compartment has numerous auger holes, through the planking of the vessel to the sea, so that the sea-water has free access and circulates freely in the compartment as and when the vessel is in motion; thus the fish live and feed almost as though free in the sea; or, the sea water is pumped into the dry well of fishing boat to the bottom of this compartment, thus ensuring its thorough circulation through the wells till it escapes from the surface, carrying with it any dirt or scum by means of wide-mouthed escape pipes, which are led through the bottom of the boat into sea and are inclined aft so that by the motion of the boat the water from the compartment or wells is drawn by a process of aspiration.

- (B) The keeping of fish alive in chests or pens near the shore. The chests are usually made of wood, square and perforated with holes or slots and of such size as may be convenient. They are securely moored in the harbour or in some sheltered place to which live fish is transferred from the fishing vessels.

(2) Refrigeration by means of ice in abundant quantity to keep fish in as much fresh condition as possible and prevent it from getting tainted and to reduce and maintain the temperature at 30°F. It must be remembered that fish, in the early stages of decomposition, is apt to be highly toxic, and this can be arrested by icing. Thus large quantities of ice are carried on the fishing boats, so also in lorries from the shore to the markets and for packing fish parcels during transit by rail. I shall not here touch on the methods of refrigeration in cold storage plants, as I have already dealt with these practices in my article on 'Preservation of perishable foods in Cold Stores' in the *Indian Veterinary Journal* Vol. XX No. 4. Researches are going on and improved methods are adopted; but the principles remain the same. I would recommend for your perusal a recent article—'Fresh fish for months on end,' which appeared in the *Sunday Standard* of Bombay of March 26th 1950. It is an interesting article.

(3) Desiccation or drying with or without salt. In India, general methods of curing fish are by drying and wet methods, which yield an article not unwholesome but are not attractive or appetising. The reason is that, although the methods are correct, the finished products are unsatisfactory due to carelessness in their application. Desiccation removes so much moisture as will prevent putrefaction, as bacteria can thrive well in the presence of moisture and if the moisture is sufficiently removed the bacteria will become incapable of action and putrefaction ceases. It is the intra-cellular moisture amounting to 75 to 80 percent of the total weight of the raw fish that has got to be rid of, lying below the surface of the fish to

depth of tissues. For this reason the desiccation process must be carried through rapidly and thoroughly before the fish gets tainted. This can be achieved by (A) Heat (B) Dry air (C) Salt and other extractives (D) Salt and Pressure. In cases (A) and (B) moisture alone is removed from the cells of the fish by hot or dry air. In case of (C) by osmosis which displaces the fluid contents of the cells including not merely water but also nutritive elements like Nitrogen and Phosphorous; while pressure acts by driving the contents of the cells together with what has been removed by the use of salt. In theory, the best method of desiccation is by heat or cool dry air without the aid of salt. Drying is preferred to wet salting by the fishermen in India as the process is simple, handy and cheap owing to the presence of the sun always. Even if the salt is applied, it is used only sparingly, putrefaction being prevented by subsequent drying. It is interesting to compare this practice with those obtained in other countries, where the salt is used to remove most of the moisture. Drying in the sun, or in an artificial drier, is only for producing the finished article. It is, however, very unfortunate that simple drying in the tropical sea coast is difficult, for the air, though hot, is very moist and when the sun dries quickly leaving the exposed surface into hard crust which hinders the moisture inside the tissues from evaporating. Except in case of thin or flattened fish, like the Bombay Duck (Bummelo), Ribbon or Cut Lass fish (Wagti), Pracons (Kolambi or Zingas), Silver Belly (Surgatta), Eels (Bom or Wam) etc., simple drying does not yield satisfactory results; consequently, salt has to be added before exposure to the heat of the sun.

The methods employed in Bombay area for curing the fish are as under :—

A. *Sun drying* :—Sun-dried fish exceed in quantity than fish cured in any other way. The chief sun-dried varieties are Bombay Duck, Wagti, Prawns, and Eels (Bam or Wam)

B. *Curing with salt* :—The following varieties are salted and dried viz. Mackerel (Bangada), Pomfret (Saranga), Silver Fish (Karli or Datali), Sardine (Tarli), Seer Fish (Surmai), Jew Fish (Ghol), Sharks and Raya (Pakhat). The quantity of fish cured by wet salting is comparatively small.

(4) The fourth method of preservation is by the use of antiseptics such as salt, smoke, vinegar, boric acid, etc. Fish like meat, vegetable and fruits can be preserved also after being gutted, cleaned and spiced by the use of such preservatives as salt, smoke, vinegar, sugar and salt-petre and various other preservatives. Salt pickling in fish trade means preservation of fish with salt in tight barrels or pickling in brine solution. Ordinarily, in domestic use, pickling refers to the preservation of food product in vinegar. Brine is a solution of ordinary salt in water, but,

when artificially made for the immersion of the fish, it should be "strong enough to float a potato". One measure of salt to 5 or 6 of water is a common proportion. But, in refrigeration, brine usually means a solution of Calcium Chloride; this is also the brine bath in which cans are often boiled when steam is not used, since brine only boils at a temperature much above that of boiling water. It may be of interest to note that all preservatives are 'chemicals'. It is, however, absurd to condemn them as such; for instance, boric acid merely because it is a chemical. So would be salt which is Sodium Chloride; or vinegar or smoke because they are the dilutions of Acetic Acid, Pyroliginous Acid, Phenyl etc. Moreover, poisonousness is not an absolute term; substances that are poisonous in concentrated form may be harmless or prove beneficial if properly diluted; eg. creosote is harmful in pure state but as the chief preservative element in wood-smoke, where it is in a state of weak solution, it is perfectly harmless and may prove beneficial apart from its antiseptic properties. Acetic acid is a strong corrosive poison but, in a weak diluted solution as vinegar, it is often dietetically wholesome and also possesses germicidal action against pathogenic bacteria. Similar is the case with Boric or Salicylic Acid. These, when used as surface applications in minute quantities required for antiseptic purposes, the chances of poisonous effects are negligible considering (a) that after curing is effected only a portion of the article remains in the food, (b) that this amount can ordinarily be washed away before steeping in water or during cooking (c) that fish will only be used occasionally as an article of diet and (d) that fish ration will seldom exceed a fraction of a pound.

The type of fishes treated by curing in the yards may be classified as under:—

- (a) Shoaling fishes like Sardine and Mackerel that are caught in large quantities during season and (b) less abundant but the more valuable 'table fishes' like Seer (Surmai), Seer Pamfret, Indian Salmon (Rawas) etc., that are cured for getting better prices in the inland markets.

Tamarind pickling:—Packing of fish with salt and tamarind is also not practiced to any great extent in Bombay area. This process (Pada) is generally carried out by 'moplas', who hail from Madras presidency and visit annually certain fish curing yards in Bombay-Konkan.

Smoking:—There is no demand for smoked fish. However, Dr. S. R. Sethna, the Director of Fisheries, Bombay Government, smoked mackerel (Bangada) for sale in the Bombay Markets. I am given to understand that he proposes to smoke other kinds of fishes for commerce and introduce a plant for this purpose. The Bombay Government Fisheries have their own curing yards along the Bombay coast.

Canning is the fifth method of preservation in which there are numerous methods and processes which require a big plant, technical knowledge and manufacturing care and skill without which canned goods are apt to be dangerous. There are few edible foods more toxic than the contents of 'Blown' or badly sterilised cans. In the Bombay area there is no organized fish canning industry at present existing. However, the essential requirements for canning are a plant for closing the filled tins, testing the closed tins for leakage, exhausting the air by preliminary heating, venting and reclosing (or, in case of sardines, by completely filling the tins with oils) and for a final sterilising (processing) either in open baths of plain boiling water, or, of boiling brine at a temperature of at least 240° to 250° F. which will kill the toxins produced by the certain putrefactive bacteria, like the *Proteus vulgaris* (the chief bacillus for putrefaction) and *Cl. botulinum* which are very deadly and more resistant to moist heat than the organisms which produce them. The toxin produced by *P. vulgaris* resists boiling water even for hours; one toxin viz. that produced by *B. coli communis* regularly found in the intestines of men and animals resist a temperature of above 240° F. But a moist temperature of 250° F. destroys every known bacteria and its spores (if any) and all ptomaines and toxins derived from them.

8. Business methods

A few fishermen in Bombay own their own boat or fishing gear. The business is practically in the hands of *Dalals* or brokers who are wholesale fish merchants in the city markets. They advance money to the fishermen in the districts to ensure their supplies, which are sold at the wholesale rates to the fish-squatters, mostly *Koli* women, who are the retailers in the markets of Bombay. The main wholesale business is confined to the Crawford Market and to a small extent at Dr. Hakim's Market at Grant Road where daily open auction takes place of fish which arrive by head loads, cart loads and lorry load from various *Bunders* (Wharfs) and Railway stations packed in ice from the different places of import. The wholesale business is done on credit system, the prices depending on the fluctuations in the markets, on which also depends the retail rates. Often it is customary with the *Dalals* of the markets to store their stock conveniently in the city's cold storage plants, where the supply is plentiful. Thus they create an artificial shortage of fish, sell at higher prices, particularly when the supply is limited and make good profits.

9. Anatomical characteristics

Fishes are cold-blooded vertebrates. They vary very much in size and shape. They are the lowest of the vertebrated kingdom. When brought out of water, they perish very quickly with very few exceptions, these being the air-breathing fishes which are provided with accessory

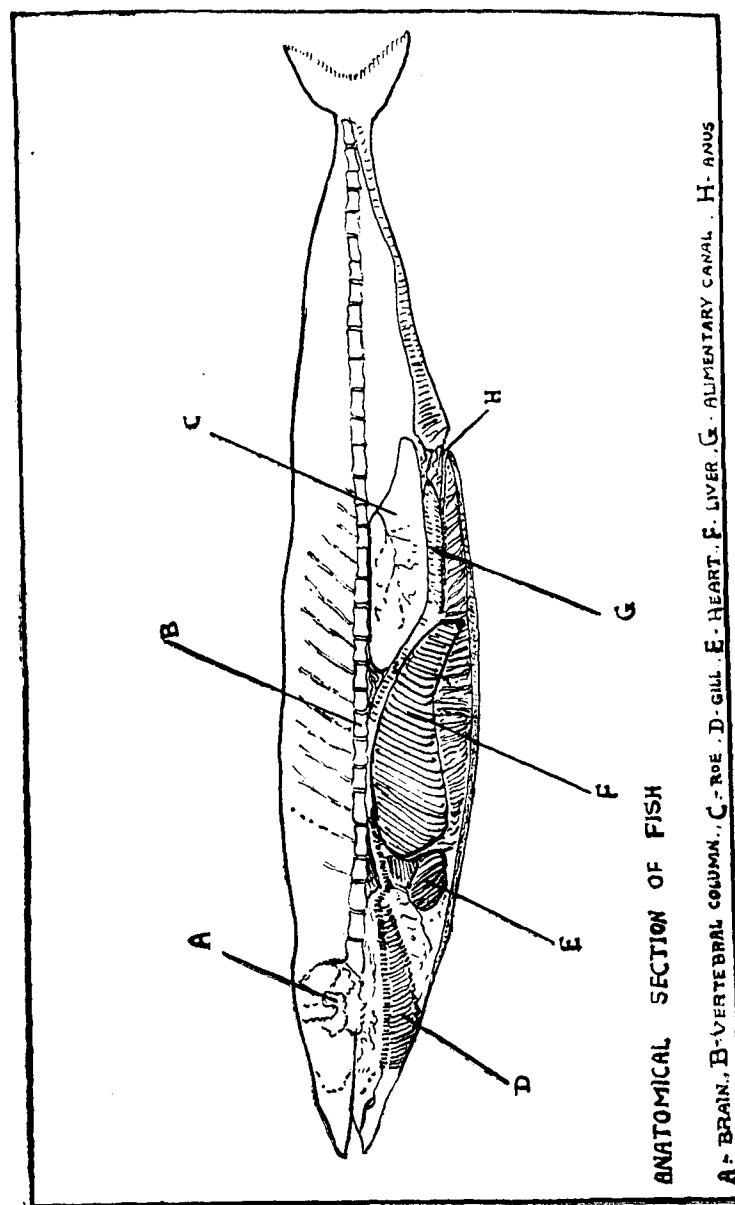


Photo of the Skeleton of a Fish.

respiratory organs well developed to oxygenate their blood directly with atmospheric air, as in the case of certain fresh water fishes, which continue to live out of water when they are kept moist.

Fish may be divided into two classes:—(A) Round fishes (B) Flat fishes. Round fishes are the swimming fishes which live at various depths from the surface of the sea. They possess darkly-coloured dorsal, but whitish-coloured ventral surface. Flat fishes live at the bottom of the sea and are particularly adapted for this purpose. They have asymmetrical bodies and lie on one side, usually left, which is white in colour. The upper side is of brownish colour. This protects the flat fish from its enemies, which find difficulty in distinguishing its dark body from the darkly coloured bed of the sea. In young flat fish, however, there is an eye on each side of the head, but, with growth, a remarkable transition occurs and the eye on the lower surface moves to the upper surface. Fish possess for their propulsion in water a number of limbs. They are called fins which are supported by spines, termed Fin-Ray. The fins of fish are of two types, paired fins and vertical fins. The paired fins consist of one pair on the fore part of the body posterior to the gills and upon the shoulders, called pectorals, while another pair on the lower surface of the body on the belly, called the ventrals. These paired fins are not of any great use for movement but help the fish to maintain the balance. Either or both these pairs (pectorals and ventrals) may be absent in fishes. The vertical fins are the Caudal, Dorsal and Anal. In some groups of fishes there may be two dorsal fins either touching one another or separated by a small or considerable space. Sometimes the dorsal fins may consist of adipose growth of skin and have no supporting membrane. It is then called the adipose dorsal fin. In the flat fishes the dorsal fin on one side, and the ventral and the anal on the other, extend from the head to tail. The bony structure which supports the fish may be either simple or branched. When the bony filaments are composed of numerous branched joints they make the fins flexible. In such cases the rays—the structural bony fabrics—are said to be articulated and jointed. Fin rays are described as soft rays. When the ray is neither jointed nor branched, it is described as a Spine. The lack of joint is what distinguish a Spine from a ray as some spines may be quite soft and flexible. The caudal fin has several shapes. It may be deeply forked, truncate, rounded, lanceolate or ovate. The structure of the tail in Elasmobranches group (viz: sharks, saw fish, skate and ray) is peculiar.

Scales of fish are cycloid when their upper margin is evenly curved or smooth, and ctenoid, when the upper margin is rugged and presents a broken and serrated appearance. The skin in Elasmobranches is covered with placoid scales (or shagreen), or, with bony bucklers, or else it may be

naked as in the case of saw-fish. Shagreen is untanned skin of sharks used for the manufacture of small leather articles and covers for daggers etc, the granulated surfaces being natural.

The skin of a fish consists of a layer of connective tissue, which contains the characteristic scales (described above) and a delicate outer layer, the epithelium. The vertebral column passes down the middle of the body from the brain to the tail, with long bones radiating from the vertebræ. The head of the fish is the wedge which cleaves the water. The pressure of the surrounding water leaves the mark on this organ which gets moulded according to the speed of the movement. The head is perhaps the most variable part of the fish. Snout is the portion of the head in front of the eyes. The nostrils are two openings and usually lie above the snout. The mouth shows variations dependent on the nature of the food of the fish and the method of obtaining it. It may be narrow, or pointed, or may be just an extremely wide cleft. It may be pointed upwards or downwards. If the mouth is in front of the snout, it is described as 'anterior'; if, on the lower surface, it is 'inferior'; but when it extends on each side, it is termed as 'lateral'. Round the mouth there may be fringes of skins. They are called 'barbels', or 'feelers' as, by their aid, the fish can feel for its food without seeing it. The barbels, are Nasal if they spring from the nostrils, Rostral if from the snout, Maxillary if from the upper jaw and Mandibular if from the lower jaw. The skull consists of cartilagenous capsules in which are located the organs of smell (nostrils described above) and also the auditory organs.

The eyes of the fish are usually large. The size and their position vary in different groups. They lie close together on one side in the flat fish e.g. Sole fish; on the top of the head in the Mullet (Mugil Species); but usually they are separate. Fishes do not possess eye-lids but in some fishes folds of skin, circular or lateral, are developed partially or completely covering the eyes called adipose eye-lids. The eyes possess spherical crystalline lenses owing to dense surrounding medium, so that the eyes protrude when the fish are freshly caught, but collapse when exposed to air.

The essential difference between the fish and the air breathing vertebrates are in the respiratory and circulatory systems. The former consists of bronchiated structures commonly called Gills and covered with gill-flaps. These flap-like folds of skin are supported by a number of bones moved by muscles, which cause the gill to open and shut. The supporting bones are called 'Opercles'. The water which has entered through the mouth, traverses the gill clefts, bathes the gills and finds its exit from the body at this place. False or rudimentary gills are found in many fishes, being situated anterior to the gills proper. In the bronchioles the blood is brought in contact with the oxygen which is separated from the sea water by a process of osmosis. Thus the oxygenated blood passes from the gills

to the heart, which is a wide shaped organ situated in the comparatively small thorax of the fish. The heart consists of two chambers only, the upper one the 'auricle' the lower one the 'ventricle'. The impure or the venous blood enters the gills where it becomes oxygenated and passes to the auricle. Leaving this it enters the ventricle from whence it is propelled through the aorta to the body by contraction of the ventricular muscular walls.

In the thorax, there is one other organ the swimming-bladder-which is filled with glossy fluid and located in the pharynx below the vertebral column. The function of the swimming bladder is hydrostatic, that is, for balancing the body of the fish in water. Diaphragm separates the thoracic cavity from the abdominal cavity which is covered with a lining membrane—Peritoneum—which is blackish in colour. The abdominal organs consist of Liver, a long flat organ, Spleen and the Stomach, an elongated U shaped tube which communicates with the pharynx and mouth by a small tube. There is another comparatively short tube—the intestine—communicating with the exterior at the anus. In some fishes like rays, sharks etc., the intestines and other excretory ducts terminate in a cavity called 'cloaca' prior to communication with the exterior. There are numerous fleshy off-shoots from the stomach and the intestines which are fringe-like in appearance, between 40 and 80 in number, called the Pyloric Appendages, wherein fat is stored for use of the body during the process of 'spawning' in female and 'milking' in the male fish. Above the stomach and attached to the vertebral column are two long bean-shaped 'Roes'. These are Egg sacs, yellow or pink in colour. They are the reproductive organs of fish. 'Soft Roes' are from the male and 'Hard Roes', from the female fish. Apart from this difference, there is little variation between the two sexes. The female fish is little larger than the male.

Before spawning by the female and milking by the male, the fishes are in good condition, but after these operations they are weak and the roes are small and thin. Fish possesses enormous powers of reproduction. There is the cod-fish which lays its millions of eggs, the salmon 30,000 or so per season, descending to the rays which lays a few hundreds. It may be mentioned that all of these ova do not hatch, often only a dozen or so materialise. The ova of fish are deposited by the female, afterwards being fertilised by the male. The female does not usually take care of the eggs, the exception being the Cat fish which carries its eggs on the ventral surface of its body. In the case of Elasmobranches group which includes shark, saw fish, skates and rays, the eggs are large and hatched within the body or deposited in a leathery case.

The muscle of the fish consists of a large lateral muscle on either side of the vertebral column and radial bones. These are sub-divided

into several numerous segments and also separated into dorsal and ventral parts by a longitudinal groove. The surface is marked by a number of zig-zag stripes, formed by the tendinous divisions between the segments. The flesh, except in case of certain red-fleshed fish, is very white. It may however, be slightly pink or blue due to the action of the digestive juices of crustaceans upon which the fishes live.

10. Inspection of fish as to wholesomeness

(A) Signs of fresh fish

1. Fish is firm to touch, solid and opaque, not semi-gelatinous or watery.
2. Skin is bright and glistening.
3. Flesh adheres firmly to the bones, scales are intact, gills bright. Cases are on record where gills have been artificially coloured with fresh blood or with red dye to give the appearance of being fresh.
4. Eyes are full and not sunken in their sockets i.e. they protrude and are transparent.
5. Fish smells fresh i.e. there is no unpleasant odour or smell.
6. On holding the fish in a horizontal position on the palm of the hand, it remains rigid without dropping of the tail.
7. In flat and flattened fish, the skin is smooth, moist and closely adherent to the flesh; it is a bad sign if the skin is blistered.
8. Specific gravity test—fresh fish sinks in water, bad fish floats.

(B) Signs of staleness

1. Flesh is flabby and soft.
2. It readily separates from the bones leaving a discolouration like that of rust in those parts of the flesh which have been in contact with the bony structure.
3. Eyes are sunken in their sockets and are dull.
4. Gills are dis-coloured.
5. Disagreeable odour or smell.

It should, however, be borne in mind that smell alone is not a sure guide, because fish, having been kept in ice, may smell fresh and yet change very rapidly when removed from it.

Fish ought to be gutted as soon as caught. Norwegian fishermen not only gut fish but also bleed them by making incisions below and behind the gills or above the tail. Fish treated in this manner is said to

keep better. All fishes are gutted before they are kept for being preserved in the cold-storage plants. Knocked about or bruised fish generally goes bad and should not be used. It is very important that fishes should be in season. As mentioned before, they are in the best condition before spawning, thereafter they become thin, poor, watery and unfit for food.

11 Parasitic infection

Many parasites attack fish, more specially when in poor condition. They belong to the classes of Cestodes, Nematodes, Trematodes and Leaches and, although found living at the expense of the fishes in their live stage, very few are considered sufficient to condemn the fish when lifeless. Fish, specially when young, may have the alimentary canal full with nematodes etc., yet show little or no sign of ill health as a result of such a cargo. Trematodes and Leaches are found specially on the surface of fish. Several of them attack flat fish and rays. They are ectoparasites. There is also a group of parasites called Lixnians, which live on the skin or gills of fishes, in many instances reducing them to emaciation, whilst another order commonly called fish lice, but are really small crustaceans of the order Calgi, and obviously not lice, fix themselves to the skin of osseous fish. If the fishes are found affected with these parasites in large numbers rendering them watery and soft, they may be considered as unmarketable. However, from the point of fish inspection for human consumption, the encysted form of tape-worm *Dibothriocephalus latus* (or the broad-headed tape-worm) is the only one found to be harmful to man.

Dibothriocephalus latus.—It is unarmed and has no hooks. The genital pores are central in each segment. Head is lanceolate and in place of suckers, carries two long canals or Bothria. Segments are much wider than long and, when ripe, the terminal segments remain attached for a while.

Biology.—The habitat of the adult *Taenia* which attains a length of 25 feet is found in the intestine of man or dog where sanitation is neglected. The eggs or proglottides pass from man to water, where they infect the primary host—the turbot, pike, perch, salmon etc. The worm-like embryo, $\frac{1}{4}$ – $\frac{1}{2}$ inch long, lies slightly curved in the muscles of fish but not encapsulated like cysticercii, is whitish grey in colour, the surrounding tissue being transparent. The *Plerocercoid bothriocephalus* may be found in the pyloric appendages of turbot. Consumption of the affected fish by man introduces the embryo into the stomach, thereby completing the cycle. This tape worm which develops in man from the larval forms found in fish may cause gastric disturbances or nervous troubles as the result of reflex influence, especially disturbances of sight. Finally, it may cause acute

anaemia, which disappears as soon as the worm is expelled. It is, however, not possible to exclude all this fish from sale, since it is not practicable to inspect the presence of the larval tapeworm. However, the sanitary authorities may warn the public against the consumption of raw pike, turbot, perch, or salmon in infected districts. But it may be noted that, since the improved system of sanitation for the disposal of sewage (human secreta), the danger has almost disappeared.

12. Shell fish, their sanitation and mode of inspection for wholesomeness

Shell fish are sea-animals in armours and may be classified under two heads:—(1) The Crustaceans and (2) Molluscs or soft bodied animals in shells. The Crustaceans used for human food are crabs, lobsters, cray fish, prawns and shrimps. They are generally boiled or cooked before consumption. Boiling turns the shells red or pink due to chemical change in the natural pigment. All prawns, shrimps and lobsters are aquatic and most of our commercial species live in the sea or in the estuaries of our great rivers.

The crustaceans usually possess 20 segments and 19 pairs of appendages. The head and thorax pressed together to form 'Cephalothorax' is encased in a calcareous shell, the carapace. The abdomen is visibly segmented, each segment is dorsally protected by a calcareous surface like that of the cephalo-thorax. The appendages, the feelers, legs, swimmers, etc., are modified to suit the various functions to which they are adapted. Respiration is carried on by the bronchi or gills which are enclosed in the carapace. The sexes are separate.

Moulting:—All prawns and crabs have a hard shell on the outside which protects the animal and supports the internal organs. It also affords points of attachments for the muscles with which the animal moves. It plays therefore the part of a skeleton but, unlike ours, the exo-skeleton is outside the body. As it does not increase in size after it is formed and is inflexible, the animal has to cast its shell periodically in the stage of growth. This is known as moulting. During moulting, the shell splits and is cast away leaving the animal with only a thin flexible membrane. This grows rapidly by the absorption of water and gets gradually hardened by the deposition of calcium salts. This process goes on over and over again. Some of the animals have the power of voluntarily throwing off their limbs and regenerating them later.

Crabs are essentially aquatic animals but some have taken to land. They are known as land crabs and are a great pest in rice-fields. On account of the necessity of keeping their filaments moist, most of them have to live comparatively near water. There are marine crabs and fresh water crabs; so also with prawns.

Inspection of shrimps and prawns as to wholesomeness—Take a handful of them. If good, they will feel dry and crisp, appear clean and have fresh smell. If unsound, they will feel sticky and soft, and smell bad. A peculiar condition is that they become 'heated'; if the hand is placed in a quantity of them, it will get distinctly warm. Good crabs and lobsters have a fresh smell, bright appearance and the joints are stiff and springy. Signs of staleness are: foul odour, especially under the tails; stickiness under claws; and probable discolouration of undersurface of body and tail. In fresh lobster there should be a springiness about the body and tail, when pulled and released. Lobsters and crabs are marketed alive. They should be heavy for their size; if light, their flesh is watery. They decompose very rapidly after death and therefore should be put when yet alive into a pot of boiling water. If they die before being cooked, their flesh is not wholesome.

Molluscs.—Among the edible mollusca for human consumption are oyster, scallop, mussel, clam, cockle, whelk and periwinkle. The first five are provided with bi-valves and the last two are uni-valved.

Of the above mollusca we may consider only two varieties—Clams and Oysters—found in our parts.

Clams are abundant during monsoon when fish is scarce. They are used by the poor people living along the coast. They are cheap and tasty. The important varieties are (1) Tapes and (2) Meretrix. Tapes are brackish-water species thriving on stretches of clean sand. They are also found in places where the sand is mixed with mud. Too much of fine mud or high temperature are injurious. As regards Meretrix, its habitat is the same as of the former. The flesh is finer and the shell is thick and massive. The usual size is two and a half to three inches, weight about 1 oz. The breeding season for clams lasts from March to June. They are generally marketed as above and are also sold with the shell removed. The shells are broken against the stone, the meat is extracted with a push of the thumb and dropped into an earthenware pot containing fresh water. Clam meat absorbs water and increases by about 1/3 of its original size. Clam meat can be preserved. Clams are boiled for about 20 minutes, when the shells begin to gape. The meat is shaken out and dried. Clam shells are used for lime burning.

Oysters are considered the aristocrats of shell fish and are delicious. They contain glycogen, fats, vitamins and iodine. They are very easily digested. Oysters are fished from November to March. During this season they are white and plump and in a good marketable condition. Oyster farms are exposed at full low tide. The beds lying below the low tide marks are fished by diving. After collecting, the shells are opened and the meat is scooped out. Oyster meat is stored in sea water in an earthen pot. Oyster shells yield, when burnt, an excellent quality of lime. All shell fish such as oysters,

mussels, cockles etc. for human food should be gathered from clean 'layings' beds, ponds or shores, where sewage cannot gain access to them. Many outbreaks of enteric or poisoning are on record, which are traced to consumption of shell fish of various kinds contaminated in such manner. In countries where such outbreaks occur, two types of illnesses are generally met with.

(a) Ptomaine poisoning which appears immediately after eating shell fish.

(b) Enteric fever which appears after a period of incubation.

Shells of oysters etc. should be thoroughly scrubbed and cleaned before they are placed in common vessels, preferably of white impervious material of earthen pots, which could be easily cleaned. Weak oysters should at once be removed. It is desirable to procure fresh oysters daily from 'beds' and their shells should be thoroughly cleaned before they are despatched. In living oysters, the shells are tightly closed, or, if open, should close immediately when tapped. Failure to do this shows that the oyster is dead. If the shells gape and do not at once and vigorously close on handling, the oyster should be rejected. Attacks of gastro-enteritis frequently follow eating oysters which, though not decomposed and smelling, are no longer fresh and alive. It is therefore essential that oyster should be alive when opened and consumed immediately.

13. Conclusion

In conclusion, it may be mentioned that Bombay is a maritime city. It has, therefore, great facilities for developing the fish trade. The fish industry in Bombay is being given a great fillip by Mr. G. D. Tapase, the Honourable Minister for Fisheries, Rehabilitation and Backward Classes. A fisheries advisory committee has been formed to chalk out plans to develop the industry by Government. An immense responsibility rests with the fishing industry in the present campaign on the food front, where self-sufficiency had to be achieved and the development of fisheries on a large scale is bound to overcome the shortage of food in the country. Government has been giving advice, guidance and financial aid through the Directorate of Bombay Fisheries (under Doctor S. R. Sathna, the Director) and about Rs. 1,50,000/- are spent annually on the education of the fishermen's children by the establishment of fishery schools, the training of apprentices from the fishing community as mechanics and navigators and such other activities besides research stations, curing yards, provision of refrigeration, ice-plants etc. Government has already made available to the industry nearly 8½ lakhs of rupees by way of loans and further assurance has been given to render all possible aid to fishermen provided they were organised on a co-operative basis. Surveys of Bombay waters have been done, both in the past and present, by Government and trawling operations

were done to find out the areas, depths, latitude, longitude etc. at which fishing could be done profitably. Several contributions have appeared from the pen of Sir Reginold Spence (the former secretary) and Mr Pratei (ex-curator) and their collaborators. So also from Dr. Sunderlal Hora of the Zoological Survey of India and others on game fishes in India in the journals of the Bombay Natural History Society. Specimens of food fishes available in Bombay Markets are exhibited in the gallery of the Zoological Collection of the Prince of Wales Museum in Bombay.

Government has now on their staff Dr. S. R. Sethna, the Director of Fisheries Departments. Last, but not least, Bombay has taken a step further for establishing an Aquarium (called the Taraporewalla aquarium) for the study of marine biology, and when the building works are completed at the Marina, near the Charni road gardens, Chowpati sea-face, it is hoped that it will be one of the finest of its kind in Asia.

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CONTAGIOUS CAPRINE PLEURO-PNEUMONIA*

By

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Introduction

This disease has been known to exist in goats for a very long time, but it has been brought to the notice of the profession only from 1942. As goats and sheep are usually maintained by the poor populace in remote villages far away from the influence of the Veterinary Department, this disease amongst goats has been causing a great economic loss to them.

Till September 1942, the disease was thought to be Caprine Pasteurellosis on the basis of the reports sent by the Bacteriologist. Prophylactic measures like serumisation and vaccination to control Pasteurellosis, however, failed. It was only after the investigations carried out by Mr. S. R. Chadha, the then Disease Investigation Officer, in collaboration with the officers of the Indian Veterinary Research Institute, Mukteswar-Izatnagar, that the disease was conclusively proved to be of virus origin by the isolation of the specific virus *Borrelomyces peri pneumonii-caprii*. The same disease was investigated by Longley in Madras. His findings were confirmed in the above mentioned investigations. Since then the disease has been reported as occurring in all the States throughout the length and breadth of India.

The disease itself is specific to goats. Cattle and sheep housed in the same pens or sheds did not contract the disease, while goats alone succumbed to it. Goats of all ages were found to be equally susceptible, excepting those below six months of age. There was no sex preference to this disease and males and females were equally susceptible.

The disease makes its appearance twice every year in endemic areas taking the greatest toll every three years.

Indiscriminate introduction of newly purchased stock into herds where the disease never existed before is perhaps its starting point in such herds. Once the disease is introduced, periodical outbreaks make their appearance with clock-like precision and goes on decimating the stock till the entire goat population is wiped out. In the author's experience, Kathiawari goats are found to be particularly susceptible while the local indigenous goats are less so.

Incubation Period:—It varies from 3 to 7 days, when the outbreak is on; healthy goats introduced into the flock contract the disease in 3 to 9 days.

Symptoms:—One of the earliest symptoms noticed is cough in paroxysms, which increases in severity and intensity as the disease advances.

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This is followed by nasal discharge, uni or bi-lateral, which at first is thin and watery later becomes thick and mucinous, and finally mucopurulent and yellowish white in colour, and thickly semi-solid in consistency. The temperature varies from 105.4° F. to 108° F. Coat is staring and the animal stands with an arched back with a tendency to stand apart from the healthy animals. Respirations are accelerated at first, but become dyspnoeic and abdominal as the disease advances. Auscultations and percussions reveal consolidation of a large part of lungs. In many cases pleuritic ridge was typically present. Pressure on the chest wall was very painful. In later stages the suffering animals are seen to be quite indifferent to their surroundings and die in about 5 to 13 days' time, though a few cases have been noticed to linger over 2 weeks. A peculiar feature of the disease is that the suffering goats go on eating till the very end. As the disease advances the animals stand with a very characteristic pose quite pathognomonic of the disease. Head and neck become stretched forward with the fore limbs kept wide apart. This feature, together with the other symptoms of nasal discharge and arched back, will readily help one to pick up an affected animal from the rest of the stock.

Post-mortem lesions:—Evidence of nasal discharge which is mucoid or muco-purulent in nature. Eyes sunken; usually the mucosa was cyanotic. On opening the chest cavity the characteristic lesions of Pleuro-Pneumonia are found. The affected lungs are found to be adhering to the chest wall, to the pericardium and sometimes to the anterior surface of the diaphragm. Usually the lesions are unilateral with the right lung more commonly involved; bilateral lesions were noticed only in 2 out of 18 cases autopsied. Distinct evidence of marbling (thickening of the interlobular septa) was noticed in 2 cases. Cut pieces appeared denser and hepatized and readily sank in water. The thoracic trachea and bronchi appeared congested and usually appear filled with whitish opaque froth.

A thick yellowish white fibrinous deposit is found covering the lungs and the corresponding part of the costal pleura. Exudate from the chest cavity, on removal, clots readily indicating that it is very rich in fibrin. When the exudate was found well organised, the lungs were found to be closely adherent to the chest wall and to the pericardium, the adhesions being detached only with difficulty. In very advanced cases pericarditis with thickening of the pericardium is noticed. The abdominal viscera did not show any abnormality.

Smears from lungs and exudate did not reveal any Bacteria and Protozoon parasite.

Lung materials from typical clinical and from a few experimental cases that died or killed in extremis were submitted for histo-pathological examination to the Indian Veterinary Research Institute, Mukteswar, Izatnagar which reported as follows:—

"All specimens of lung tissues from clinical as well as experimental cases show changes indistinguishable from those associated with Contagious Caprine Pleuro-Pneumonia".

The Officer-in-charge, Pathology and Bacteriology Section, Indian Veterinary Research Institute, further advised the use of crude lymph-pleural exudate from a clinical case destroyed *in extremis*, or culture vaccine, and that he believed that goats in this Province tolerated vaccination with crude lymph.

Experimental studies:—Six healthy goats got from a healthy area were used for this experimental purpose. Three goats were infected intranasally with exudate from a clinical case destroyed *in extremis*. Two were inoculated subcutaneously in the neck with 5 c.c. of fresh pleural exudate and the sixth was inoculated with 3 c.c. of heart blood subcutaneously.

All the three goats infected intranasally contracted the disease and succumbed, showing the typical pleuro-pneumonia lesions, from the 7th to 9th day after inoculation. In them febrile reaction was noticed from the 3rd to the 7th day.

The two goats that were inoculated with the exudate subcutaneously and the one inoculated with heart blood did not show any evidence of the disease during ten days of close observation, and even later when frequently examined.

Two rabbits were inoculated with 0.5 c.c. of heart blood—one subcutaneously and the other intravenously—and they did not show any evidence of Pasteurellosis. They were discharged after 6 days.

During war years, there was a very great demand for goats. The occurrence of this disease at that time actually decimated the goat population in this country. As no reliable vaccines were available, some officers adopted the vaccine recommended by Longley (Carbolised or formalised Lung-mash vaccine) with widely varying results. Treatments were undertaken in Ceylon (Crawford) and in Assam (Gopalkrishnan) using Arsenical preparations such as N. A. B. (M. & B) Neosalvarsan etc. with not very encouraging results, though some workers found in them a specific remedy, which finding, however, could not be confirmed on controlled experimental cases.

The author takes this opportunity of recording his experiences of a few outbreaks of this disease which he investigated in the different parts of the state of Bombay.

Though reports are received to the effect that a successful vaccine has been evolved at the Indian Veterinary Research Institute, outbreaks of diseases cannot be made to wait till the abovesaid vaccines are received. So the author decided to make use of the vaccine recommended by Longley. The results of this vaccination form the subject of this note.

Thana district is an endemic area of this disease where outbreaks occur twice every year, the first one immediately after the onset of monsoon rains in July and the second in early winter months, *i.e.* December. The illiterate goat owners and villagers, who are of a superstitious bent of mind, seem to have more faith in the village quacks, who are popularly known in this tract as 'Dagya', as they believe that the diseases are brought about by divine wrath, and as, further, the quacks mix up religious rites simultaneously with a crude form of vaccination.

The author had an opportunity to observe closely the entire performance in this direction by one of these quacks (Dagyas) in the village Sarvalli in Thana district. The Dagya waits for the typical case to die. Directly it is dead, he forthwith takes a bath and clads himself with a new dhoti or loin cloth. He then takes the freshly dead carcase, which is kept untouched by others. To the accompaniment of some 'Mantras' he cuts its throat open and allows the blood to flow out. When the crimson fluid has ceased to flow, he carefully opens the chest cavity, takes out the affected lungs, cuts them into very minute bits of the size of rice grains, keeps this mash in a clean brass vessel (Wati) and exposes these pieces to the smoke (over the fire) of the sweet-smelling resinous material—Benzoin—or, Loban, as it is called in this part, for about 5 minutes. It is then ready for the so-called vaccination.

This is done by laying hold of one of the ears of the goat in the left palm followed by a clean bold horizontal incision by a knife in the right hand in the middle of the ear. The incision is about $\frac{1}{2}$ an inch in length, is skin-deep and does not go through the cartilage. The Dagya then takes out a wooden handled nail-like thing called 'Khil' or Poker makes a pocket through the centre of the incision, deposits a small bit of the smoked piece of lung and presses it into the pocket. When all the goats are treated in this way, he collects neem tree leaves (*Margosa Indicum*) makes a paste of them, and mixes it in goats' milk. The treated goats are made to stand close together in a very limited area and he sprinkles this mixture liberally over these goats, to the accompaniment of his inseparable 'Mantras'. The quack then walks away having completed his trick for driving away the disease from the flock to the apparent satisfaction of the poor owner.

The author of this paper was curious to study the result of this method of treatment and therefore he visited the village 3 weeks after the show. He found that, out of 168 goats vaccinated, 46 had died of the disease while others were doing well. The disease was no more heard of either in that season or in the next year in that flock. Recent enquiries, however, showed that the remaining 122 goats also died of Contagious Caprine Pleuro Pneumonia during last season (September to November). The forty six deaths amongst vaccinated may perhaps be explained in one of two ways: viz (a) either the animals were having the disease in the incubation period, or (b) the material inserted into the ear was too strong.

To come now to the author's experience, in a village within the radius of about half a mile from the scene of the Dagya's performance, and in another village about 18 miles away, the author was able to persuade two goat owners owning 186 and 145 goats respectively to let him vaccinate their stock. The material used for vaccination was Longley's formalised vaccine which was prepared and used as follows:—

A typical clinical case of the disease was destroyed *in extremis*. On *post mortem*, the animal showed extensive pleuro-pneumonia with pleural exudation. A piece of the affected lung, together with the exudate, was emulsified and mixed with 10 volumes of sterile normal saline and filtered through sterile filter papers. To this filtrate was added 0.5% formalin. The mixture was shaken and kept overnight at room temperature. This product was inoculated at the tip of the ear in 0.2 c.c. dose, keeping a sufficient number of goats in each stock unvaccinated to serve as controls.

Details of Vaccination

Name of village	Date of vaccination	Owner's name	Total of stock	No. of goats vaccinated	No. of goats kept unvaccinated and as controls
Sanjan	23-6-48	Mr. Ganu	186	57	129
Sarvalli	28-6-48	Seram Karna	225	55	170
					12 kept as controls

Reaction ;—There was extremely severe reaction at the seat of vaccination; the whole of the ear was swollen, hot and painful, in almost all the animals. Swelling had extended almost upto the base of the ear. 28 goats of the 57 in the first village showed thermal reaction varying between 106.4°F. to 107.6°F. together with the usual accompanying symptoms.

Four of these goats in the first village and 3 in the other died 4 to 6 days after vaccination. Post-mortem examination on these cases showed typical lesions of contagious caprine pleuro pneumonia showing that these animals were perhaps in the incubation stage at the time of vaccination. The other animals returned to the normal state of health and, when observed later on, there was no indication of the existence of the disease in the stock, during that year or the next.

The unvaccinated controls in the flock however had much higher percentage of mortality. In the first village, out of 8 goats kept as controls, 6 died within 12 days, the percentage of mortality being 75%. All these deaths took place in 10 days time.

Name of villages	No. of goats vaccinated	Mortality in vaccinated stock	% of mortality in vaccinated stock	Unvaccinated controls	Mortality in controls	Percentage
Sanjan	57	4	7.2%	8	6	75%
Sarvalli	55	3	5.4%	12	5	41.3%

Chemotherapy:—In a few of the ailing cases the author attempted treatment with arsenical and sulpha group of drugs.

I. N.A.B., 0.15 grms. in 15 c.c. of aqua distillata was given intravenously to 13 goats in Sarvalli on 23-6-48. Two of these treated goats died on the 2nd day after treatment and the other 11 recovered.

In village Sanjan, 9 cases were treated similarly with N. A. B. resulting in 1 death and 8 recoveries.

In village Hanchinal, 18 goats were treated with 2 deaths and 16 recoveries.

II. 8 goats were treated with Neosalvarsan in the same village, 0.2 to 0.4 gms. being given intravenously. 3 died and 5 recovered.

III. Treatment with N. A. B. 0.15 gms. 15 c.c. aqua distillata followed by intramuscular injection of Solusepticine-10%, 5 c.c. was carried out in 8 goats in the same village. Result—4 deaths and 4 recoveries.

Discussion

A mortality of 7% and 4% in vaccinated stock, using Longley's vaccine, in the face of an outbreak in two villages, is, in my opinion, a highly encouraging result achieved by this method of vaccination, while mortality in the unvaccinated stock in the same two villages was 33% and 49% respectively.

Perhaps, if the vaccination had been carried out well before the outbreak commenced, the results might have been very much encouraging, as no vaccine, however potent, can confer immunity in the incubation phase of the disease. The absence of this disease during the two following seasons shows that a solid immunity had been left behind.

Recently, in response to a circular received from the Indian Veterinary Research Institute, arrangements are in progress to carry out experiment in an endemic area with a view to determine the comparative efficacy of the three different vaccines recommended for this disease viz :—

- (1) Attenuated culture vaccine.
- (2) Longley's carbolised vaccine.
- (3) Crude lymph vaccine.

The results of these experiments will form the subject matter of another short note on this disease by the same author. Perhaps one of these vaccines may give the ideal results desired.

The swelling at the seat of vaccination in the vaccinated lot may be attributable to the higher concentration of formalin.

The arsenical preparations reported for their efficacy by Crawford in Ceylon and Gopalkrishnan in Assam may perhaps prove to be specific remedies in the early stages of the disease. But as prevention is always better than cure, the real solution will be found in one of the three vaccines, which, if used well before the outbreak season, will give the ideal results in the control of this dread disease.

Summary

- (1) This disease is an acute, infectious and contagious disease, characterised by high fever and pleural and pneumonic exudate which clots immediately on exposure to air.
- (2) This disease has taken a toll causing a very great economic loss to the owners—it is estimated to be well over Rs. 6500/-, cost of each goat being valued to Rs. 50/- which is the average cost of a Kathiawari goat.
- (3) The period of incubation is 3 to 9 days.
- (4) The course of the disease is about 5 to 13 days, occasionally one may come across a lingering case upto 2 weeks.
- (5) Only 2 cases had natural recovery.
- (6) As regards the duration of the epizootic, it has been noted to run amongst the flocks for over 2 months at a time.
- (7) It is so far noted to be species specific and is confined to goats only.
- (8) Post-mortem lesions of the disease were exclusively confined to lungs and pleura, with consolidation of lung and fibrinous pleurisy. Pleural exudate gets solidified on exposure to air.
- (9) The disease spreads rapidly from a diseased goat to a healthy goat due to direct contact.
- (10) A detailed description of a piece of quackery practised in some of the villages in the control of this disease is given.
- (11) Prophylactic vaccination with the formalised vaccine prepared from the affected lung tissue is described and its results are found encouraging.
- (12) Treatment with N. A. B. has given recovery in 5% of cases.

Acknowledgments

I wish to express my sincere thanks to the Director, Indian Veterinary Research Institute, Mukteswar, and his staff for guiding me in this work.

My thanks are also due to the Principal, Bombay Veterinary College and the Bacteriologist and Pathologist, for their help in examination of the specimens sent.

I am also extremely indebted to the Director of Animal Husbandry and Veterinary Science, Bombay Province, Poona, for his valuable advice and guidance in the investigations from time to time.

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GOVERNMENT MILK COLONY AT AAREY

By

THE MILK COMMISSIONER, BOMBAY

The milk Colonisation Scheme of the Bombay Government aims at re-organising the milk production in Bombay City on a permanent basis with a view to increase production and to remove cattle from the congested stables in the city which are a source of great danger to the health of the public. Under this scheme cattle will be looked after on upto date and scientific lines with proper facilities, so that cost of production of milk can be brought down to a reasonable level. The scheme consists of constructing 32 dairy farm units to accommodate 15,000 cattle in the first instance from Bombay city and to establish a Central Dairy for the pasteurisation of milk and deliver the same to the consumers in sealed bottles. Needless to assert that the scheme is a bold venture on the part of Government without parallel anywhere in India and in the fulfilment of the scheme a permanent solution will be found to ensure adequate supply of wholesome milk at reasonable rates for the consumption of the people in the City. The entire scheme is expected to cost about Rs. 3½ crores.

Some important aspects of the scheme are briefly dealt with below :—

- (1) *Dairy Farm Units*:—More than 3,000 acres of land have been acquired at the Aarey village about 20 miles from Bombay City, for the colony at a cost of nearly 40 lakhs. 32 dairy farm units are proposed to be constructed

for housing 15,000 cattle. Out of these, 17 units are completed and the remaining are expected to be ready by the end of this year. Each unit can accommodate 500 cattle together with other structures for the storage of cattlefeeds, quarters for attendants etc. The cost of each unit comes to rupees 5 lakhs approximately. Each unit occupies about 8 acres of land and each will have 40 to 60 acres of agricultural and exercise land attached to it. There will be approximately 3 animals per acre at the Colony against nearly 1,000 per acre housed in most unhygienic conditions in the City stables. All units are inter-connected by well laid out cement concrete roads facilitating transport work. Electricity will be shortly installed at the Colony. 11 Units have already been occupied and more than 4,500 cattle are being housed there. The other completed units will be occupied shortly. These units are given to licensees on a nominal charge of 8 annas per adult animal per week towards interest on a capital. Free veterinary aid is provided for each unit. Government have also arranged for the procurement of green fodder, cattlefeeds and other requirements. The milk produced at the colony at present is being taken over by Government and used for the milk distribution scheme in Bombay City.

(2) *Central Dairy*:—The Central Dairy building is designed to house a pasteurisation and bottling plant with a capacity of 40,000 lbs. per hour. The Dairy building allied structures and dairy machinery cost Government approximately 46 lakhs of rupees. Milk produced at the colony would be pasteurised, bottled and transported in large insulated vans to transshipment centres from where it will be transferred to smaller units and delivered to consumers ex-centres. For this purpose milk bottles and steel crates have been ordered from England. It is expected that the construction of the dairy and installation of the plant will be completed this year.

Veterinary Aid and Artificial Insemination Centre:—It has been fully realised that provision of Veterinary aid is of utmost importance. Each unit is to be provided with a Veterinary Dispensary. Establishment of a well equipped central veterinary hospital at the colony to look after the health of the cattle in general is underway. Besides an artificial insemination centre is proposed to be established with 20 bulls.

Calf Rearing Scheme:—Large number of calves are starved to death each year in the present milk supply arrangements of Bombay. Government have in view a calf rearing scheme in which thousand calves are proposed to be reared every year. They will be resold to the licensees.

Agricultural Scheme:—Much importance is attached to the cultivation of fodder and green grass as it is realised that colony should be self contained in this respect. Large area of Jungle land is being broken up with the aid of

mechanical means and is brought under cultivation. A complete plan to produce maximum quantity of green grass and fodder for the requirements of the colony is under way.

Welfare of the inhabitants of the colony has engaged the attention of the Government and facilities are provided for medical help and for other amenities of life. When the land was acquired by Government for the Colony, it was barren tract devoid of human habitation. The place is now bristling with activity. It is hoped that Colony in time to come will serve as a model and also would prove to be a lasting contribution to the increase of cattle wealth in India.

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| 5. Biswa Ranjan Sarkhel, | { Lakshmipura Rudrachari |
| 6. Muniswami Lakshmi Narayan, | { Appajayachar |
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| 2. Behere, Gurunath Damodar | (B.S.) | 26. Lilaram Bora | (Assam) |
| 9. Deshpande, Neelkanth | | 30. Patel, Motibhai Raghunathbhai | (B.S.) |
| Laxmanrao | (B.S.) | 36. Syed, Mehboob Ahmed Syed | |
| 14. Kaikini, Ashokkumar | | Mohd, Mansoor | (Ajmer.) |
| Shripadrao | (B.S.) | | |

Passed :—

6. Desai, Vasant Gurua	(B.S.)	24. Kulkarni, Vasant Balkrishna	(B.S.)
7. Deshpande, Dattatraya Vishupant	(B.S.)	27. Mannari, Madhwacharya Naraynacharya	(B.S.)
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9. Daya Ram Panch Bhैया ... U.P.	30. Kapildeo Singh ... Gaya Dt. Bd.
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he is a fool—shun him ;
- (2) He who knows not and knows he knows not :
he is simple—teach him ;
- (3) He who knows and knows not he knows :
he is asleep—wake him ;
- (4) He who knows and knows he knows :
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—LADY BURTON in *Life of Sir Richard Burton*

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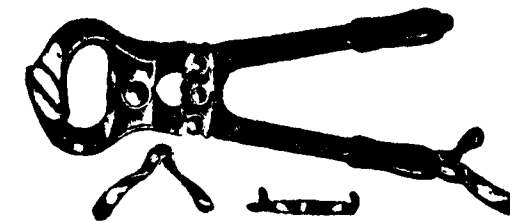
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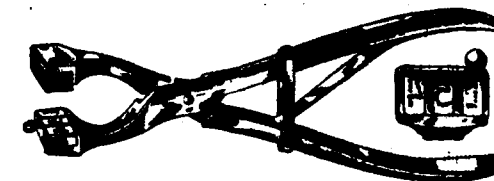
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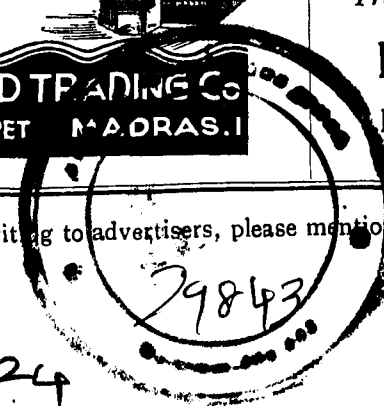
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