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G.M.V.C.,
Veterinary Surgeon,
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THE

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CIVIL VETERINARY SERVICES IN INDIA.

II

BOMBAY PRESIDENCY.

We propose to review in some detail the fortunes of the Civil Veterinary Department since its inception in the Bombay Presidency; but our efforts in this direction are handicapped by the paucity of authentic information regarding its early history. It is doubtful whether any organised agency for dealing with the veterinary needs of the Province existed prior to the year 1886, when the Bombay Veterinay College was established. This pioneer institution owes its origin largely to the breadth of vision, zeal and enthusiasm of its first Principal Prof. J. H. Steel, F. R. C. V. S. Like most other new ventures, this College too had a modest beginning and started with a staff consisting of a Principal, an Assistant Principal, two Lecturers and a Farrier Major. At the end of the year 1887, there were 64 students on the College rolls. For imparting clinical instruction to the students, the Sakarbai Dinshaw Petit Hospital for Animals was made available, through the generosity of the late Sir Dinshaw M. Petit (1st Baronet). The Bombay Society for the Prevention of Cruelty to Animals undertook the management of the Hospital, *viz.*, supply of food, medicine and attendants for the patients, and the technical staff of the College rendered veterinary aid in return for the clinical facilities afforded to the students. The College itself was located in the old bungalow and the other buildings in the Hospital premises, which were placed at the disposal of the Government by Sir Dinshaw Petit.

The first batch of 25 Graduates of the College came out in April 1889.

Improvements and additions to the staff and equipment of the College were made from time to time, but the College was rather unfortunate to lose its first Principal early in its career. Prof. Steel died in January 1891 and was succeeded by Col. J. R. Rayment, A. V. D., for a short time. Then followed Col. James Brodie Mills. He remained as Principal for about 15 years. During this period Government sanctioned the acquisition of the land adjoining the existing buildings for the construction of a new building for the College and a hostel for students. In 1909, the new College building and hostel were completed and occupied. After the retirement of Col. Mills, Col. Joslen was made Principal but his untimely death in February 1910, frustrated the plans he had formed for the further improvement of the College.

Mr. K. Hewlett, then became Principal and continued as such for about 22 years until his retirement from service in April 1932. During this period further additions in the shape of stalls for animals, Dissection rooms, Lazaretto and Incinerator, were built in close proximity to the College. Mr. V. R. Phadke, a graduate of the College was appointed to succeed Mr. Hewlett as Principal. This event is of no small importance in the history of the College, for it marked the appointment of the first Indian as head of the institution. It must be a source of gratification to the Government as well as to all those who have helped in establishing and developing this institution that so many of the graduates from this College have distinguished themselves in positions of responsibility and trust in India, Burmah, Ceylon, F. M. S., Africa and other parts of the world.

This College has been in existence now for about 47 years and during this period about 700 Graduates have emerged from its portals to supply the veterinary needs in India and elsewhere as stated above. It may not be widely known that, very recently, this Institution, with such a record of solid work behind it was sought to be brought under the Retrenchment Axe and extinguished.

We are reliably informed that the threatened catastrophe has been averted. We take this opportunity of rendering our respectful thanks to the Government of Bombay for their decision to allow the College to continue in its career of usefulness.

The Bombay Civil Veterinary Department was organised in 1889, the year in which the first batch of students graduated from the Bombay Veterinary College. That the growth and expansion of the Department during these 44 years have been too inadequate to meet the needs of the Province, is evident from the number of hospitals and dispensaries available for the treatment of animals in rural areas and the existing provision for combating outbreaks of contagious diseases of animals.

There are now 105 dispensaries in Bombay and 18 in Sind. The total number of Veterinary Assistant Surgeons is 123 in Bombay and 21 in Sind. The controlling staff consists of a Director, a Deputy Director and four Inspectors.

Taking into consideration Bombay Presidency alone, the average yearly recruitment to the Civil Veterinary Department works up to less than 3 veterinary graduates. It is scarcely necessary to point out that such a state of affairs is deplorable. The root cause for such stagnation and want of progress in a Department of Government which is admittedly indispensable for the agricultural and econmic well-being of rural India must be sought for in the policy and programme adopted. So long as the policy in regard to making adequate provision for the growing needs of veterinary work in the Provinces remains as at present, viz., to tap the resources of the Local Boards, no better progress than that achieved by the Bombay Civil Veterinary Department during the 44 years of its existence can be expected. It has been proved to be so in the case of at least one other Province. We appeal to the leaders of public opinion in the Presidency to accelerate the pace of progress of the Veterinary Department, which is so intimately connected with the well-being of the Live-stock of the country.

Sind seems to be unfortunate in regard to its Veterinary Sevices. The proposals made from time to time for the organisation of an adequate Veterinary Service, do not appear to have materialised. Now that there is a prospect of its acquiring the status of an independent Province, let us hope for the fulfilment of the need for a progressive Veterinary Department under the new dispensation.

BOMBAY'S HOUR OF TRIAL.

[This article was published in a leaflet form, immediately after the appearance of "The Thomas Report" and sent to Members of the Bombay Government, Members of the Bombay Legislative Council and other public men, in good time, as an advance copy. We are glad that since then the Government of Bombay have taken the only wise step they ought to and the thanks of the profession are due to them.]

Bombay, normally a gay and prosperous City—the Paris of the East—is now in the throes of an economic death. Even more pitiable than her death-struggle, is the way she is being treated for her complaint by Expert Physicians! The sum and substance of their prescription is that a head-ache cannot occur and continue to trouble the body, if the head is lopped off!

The process of dismemberment is to start immediately lest complications should arise! Poor Bombay! She thought there will be

safety in the multitude of counsel and called in a Committee. But the safety seems to be for the physicians and not for the patient.

We wonder if ever in recent years a more patently monstrous record was produced by any responsible Committee than what is known as the 'Thomas Report' of Bombay. We will not be surprised if it gains currency as a proverb for all that is absurd, retrograde and unstatesmanlike. Its merit lies in the fact that it can very easily beguile the unwary by the show of great concern for the Tax-payer's money, so ingeniously introduced at every stage of that report. People may not be wanting who will go *in excelsis* over that report on account of the gigantic savings shown on paper, not realising the deep game underlying the scheme and the snare set up in it. It is a masterly attempt at putting back the hand of progress by nearly a century. Under the pretext of saving the Tax-payer's money, all the nation-building departments are either to be abolished or curtailed!

We admit an international City of commercial importance and its presidency have been very hard hit by the universal economic depression accentuated by an unfortunate political situation. The huge deficit in its revenue must necessarily be very disquieting to any Government. But is the cure to be worse than the malady? Fancy a Committee proposing the abolition of all Vocational Colleges—the Agricultural College at Poona, the Veterinary College at Bombay, the Sydenham College of Commerce, the School of Arts, even the Medical and Engineering Colleges if possible are to be abolished. Hospitals are to be closed: The activities of the Educational Department are to be curtailed. Call this economy? Reorganisation? It is an insult to human intelligence. Then what is there for the Government to administer when all this process of annihilation is over? If there was no "adequate return for the money the Tax-payer spends" on the above Colleges, it was due to lack of progressive policy on the part of the Government. Neither the Science nor the College can be found fault with for want of honest attempt on the part of others to utilise those Colleges in the best interests of the country.

We shall confine ourselves to the Veterinary College at Bombay. If that is closed does the Committee think the demand for Veterinary Services will increase? Is it not vital that agricultural India should save her millions of cattle through a well organsied Veterinary profession? Does not the Committee know the enormous loss the presidency is put to year after year through preventable diseases *for want of adequate Veterinary Aid?* Did not even the last Royal Commission on Agriculture recommend the expansion of the Veterinary Department in all the presidencies? Is it not a fact that

the presidency is demanding for more Veterinary aid? With pardonable pride we beg leave to assert that if there is one Department of the Government which is gaining popularity in rural India by rapid strides, it is the Veterinary Department. The Committee propose sending students to other presidencies for training! Such a life of parasitism would have suited the conditions of Bombay a century ago. And are other presidencies going to put themselves to extra expenditure to provide for Bombay students? It all means complete denial of Veterinary aid to Rural Bombay! Well may the Tax-payer of Bombay exclaim "Oh Lord! Save me from my friends".

At a time when the College is thinking of celebrating its Golden Jubilee, the Committee have prepared a coffin for it and are asking the Government to bury it with bell, book and candle! Will the Government of Bombay accede to such an atrocious proposal? Committees can afford to be irresponsible, but a Government cannot. Let them pause for a moment and take survey of the past glory and utility of one of the oldest of such Colleges in India. Let them bear in mind the vital need of the Veterinary profession to agricultural India. Let it not be said of them that at the instance of an alarmist Committee, the usual mental equilibrium of the Government has deserted them. Is Bombay so bankrupt of financial heads as to fail to devise better methods of combating the demon of a deficit? If the recommendations of the Thomas Committee are approved and given effect to, the Government of Bombay will be staging an administrative massacre unparalleled in the history of Britssh Governmet in this unfortunate country. All eyes are on Bombay now. May God grant her wisdom enough to acquit herself creditably at this hour of her trial!

THE PROBLEM OF THE HOUR

The one question that looms large in the eyes of those who bestow some thought over the future of the Veterinary profession in India and the country's welfare is the rapid rate of unemployment that is spreading even in an infant profession like ours. Far behind other countries, India had just started equipping herself in the Veterinary field when she finds herself cribbed and cabined and pulled back ruthlessly by the so-called financial *pundits*. We witness to-day the unedifying spectacle of a profession being throttled to death before it has scarcely been born and a Government usually sane and sagacious inclined to yield to questionable cries of false economy.

To be wise after an event is a proverbial weakness of the average humanity; but a responsible Government must avoid falling

a prey to such weakness. Where an individual fails, a Government must be able to succeed. The Din and Dust of the disturbed times, the unreasonable cry of vested interests, the bogus philosophy of self-appointed advisers, the alarming cry of a few scare-mongers, the threat of a handful of professional agitators and the like should in no way dissuade the Government from its path of duty. To be far-sighted, to be clear visioned, to be calm and collected when others are in a quandry and to be courageous are attributes which are generally associated with all good Governments. Country's interests ought to be the prime concern of any Government.

Now, is it in the interests of the country to stop recruitment to the different Veterinary Services in India? Is it giving effect to the proposals of the last Royal Commission on Agriculture? Is it fair to continue the ridiculous ratio of "one man for every 700 square miles to treat nearly 1½ lakhs of cattle"? Is it wise to curb the advancement, of the profession at the very first stage of its growing popularity? Is it economy in the first place to stint a few lakhs and make the country lose in millions later on? Well, we have cried ourselves hoarse on all these points times without number in these pages and we only expect the Government, and the Departmental heads of the several presidencies *to keep on moving* where the Veterinary profession is concerned *in however small a degree,* as it is closely involved with the prosperity of the poor Indian ryot. Let not the profession be hurled down the depths of Oblivion in the name of Retrenchment. It may not be possible to raise it back again in the near future. Repentance may be too late.

We want more men to control the contagious diseases; we want more hospitals and dispensaries for the relief of the dumb suffering animals; we want more Research workers and well-equipped Institutes to tackle the many problems awaiting solution. Every taluk Board and Municipality can be made to utilise the services of qualified Veterinary Surgeons for Meat and Milk Inspection in the interest of Public Health. These are steps in the right direction, which we hope will receive due consideration at the hands of Government. We see on the one hand the country crying for more Veterinary aid and on the other, hundreds of young men being told there is no need for their services. Let there be imagination, let there be vision, let there be fore-thought, and let there be sincerity in all tall talks of serving the interest of the ryot. It is only then the Government and the heads of department would have played their part honourably and well."

Lest we should be thought to be too theoretical and not practical, we give below more definite proposals for the esteemed consideration of all concerned.

Let us take Madras. Meat forms part of the diet of most of the people and Milk is consumed by almost all. In the interest of Public Health, it is highly necessary, nay vital, to have complete control over the wholesome production of these two articles of diet. If not in all the places, at least in Cities like Madura, Trichy, Tanjore Ooty, Coimbatore, Vizag, etc., Municipal bye-laws must be so framed as to make it compulsory to slaughter all animals intended for consumption in a single central Abattoir under Expert Supervision. Similarly to insist upon Sanitary Cow-sheds, drawing of milk under sanitary conditions, arranging for Milk Depots and pasteurisation of milk and testing the cows periodically for Tuberculosis, etc., must be made. Next, measures to control Bovine and Equine Contagious diseases within Municipal areas can be taken up. These, we believe, are enough work for one Officer and a Veterinary Surgeon is most eminently fit by his training and equipment for tasks mentioned above. In addition, his services can be utilised as Superintendent of local S. P.C. A., as Hackney Carriage Inspector, and in all matters of Veterinary Hygiene and Sanitation. In fine he will be the Veterinary Health Officer of the Municipality.

What is true of Madras, is true of other Presidencies as well. A comprehensive scheme on the lines suggested above seems to us to be highly imperative and we appeal to the enlightened public, members of the Legislative Council, Heads of Departments and Local Governments to take up this question in right earnest and face it boldly and squarely. Public-Health, prevention of infant mortality, control of Tuberculosis and national vitality and prosperity are all involved with this question. Let there be *action and not inaction, progress and not a set-back.*

MADRAS VETERINARY COLLEGE RESEARCH.

A very important and outstanding piece of research work of considerable economic value relating to a widely prevalent disease of cattle known as Nasal Granuloma or "Korattai" in Tamil, has just been completed by the Lecturer in Parasitology at the Madras Veterinary College.

The etiological factor of this disease remained undetermined all these years notwithstanding the attempts made by some workers. During last year three workers in different parts of India, viz. Mr. P. G. Malkani, at the Patna Veterinary College, Captain S.C.A. Datta, at the Imperial Institute of Veterinary Research, Muktesar, and Mr. M. Anant Narayan Rao, at the Madras Veterinary College independently found the cause of the disease to be a Schistosome, but the chain of evidence was not complete without being able to produce

the disease artificially by transmission experiments. This link in the chain has now been furnished by the experiments successfully carried out (thanks to the Government for sanctioning this piece of research) by Mr. M. Anant Narayan Rao at the Madras Veterinary College.

The economic value of this discovery may be gauged by the fact that though the disease is not rapidly fatal the affected cattle become incapacitated for work and consequently the sale price goes down very considerably.

The disease manifests itself by nodular growths in the nostrils which in course of time obstructs breathing and gives rise to a peculiar snoring noise. The name " Korattai " signifies this.

Now that the cause of the disease and the mode of infection have been definitely ascertained, it is comparatively easy to adopt prophylactic and curative measures.

Prevention consists in clearing the ponds, *etc.*, of snails which act as the intermediary hosts in the transmission of the disease, so that the larval worms may not be taken in by cattle having access to these ponds.

Tartar Emetic has been found to be an agent of curative value. Further work on this problem is under contemplation.

This piece of work is but another illustration of the paramount importance of research work on parasitic diseases of animals in this country. Mr. T. J. Hurley, the Principal of the Veterinary College and Mr. M. Anant Narayan Rao, Lecturer in Parasitology, deserve to be congratulated on this splendid piece of work.

WILLIAM HARRIS Esq. V. D., M. R. C. V. S., I. V. S.

Assam sits forlorn at the departure of Mr. Harris, the father of Veterinary profession in that Province, on long leave preparatory to retirement. Born in 1879 at Edinburgh, after his early scholastic career, he joined the Royal (Dick) Veterinary College in 1897 and graduated from it in 1901, carrying away the Medals in Botany, Anatomy, Physiology, Materia Medica, Pathology and Obstetrics. He was also the first candidate to win the Wallay Memorial Prize.

He took up service in the Veterinary Department of the City of Birmingham and working under that well known Veterinarian, Mr. John Malcalm, he gained considerable experience in Meat and Milk Inspection and the carrying out of the various contagious diseases (Animals) Acts, which stood him in good stead later in life. While there, he attended the University Classes in Bacteriology and Pathology and later took up a post-graduate course on Tropical Diseases at the R. V. C. London under Sir John McFadyean.

In 1906, he joined the I. V. S., and after a year's training at the Bengal Veterinary College under Col. Raymond, he was appointed as the Superintendent of the C. V. D., in East Bengal and Assam with head-quarters at Dacca. In 1912, on the redistribution of Provinces, he was transferred to the C. V. D., Assam with head-quarters at Gauhati. Previous to 1907, there was no Veterinary Department in Assam and it fell to the lot of Mr. Harris to create one. Men and money had to be found and the creative genius of Mr. Harris has left behind to-day a well equipped Veterinary Department and the monumental structures, roads, garden, the beautiful avenue of trees and an excellent museum in the Veterinary Colony over there. Placed in a more advanced province, Mr. Harris would have played a greater part; but he did his duty truly and well under depressing conditions even in a tract like Assam.

Isolated from contact with other professional colleagues and Colleges, it was the persevering nature of Mr. Harris that was responsible to keep himself and his subordinates up-to-date in professional knowledge through medical and Veterinary periodicals. He was a strict disciplinarian, who was not afraid of doing justice, either out of fear or favour. Affable by nature, he was kind to his subordinates and helped them in times of need. He was a Major in the Assam Auxiliary Force and was a recipient of the 'Veterinary Decoration' for meritorious service.

May he live long and enjoy his well earned rest, is our prayer.

RAI SAHIB P. N. DAS

Retired Assistant Director, C. V. D., Bihar & Orissa.

Born in 1875, in the district of Faridpur (Bengal) young Das was educated at the Central College, Calcutta. Later, he joined the Bengal Veterinary College and graduated from it in 1900, topping the list and securing five prizes out of six including one "for the best all round man in the College" offered by the then Lieutenant Governor of Bengal.

In the early years of his service he was entrusted with such important duties as eradication of Glanders from the neighbouring districts of Calcutta; Cattle Breeding operation in Bengal &c., and in 1912, with the formation of the new province, he was posted as an Inspector in Bihar & Orissa. In 1913, he was asked to train up

two dozen students in the practical method of inoculation, and in 1919, he prepared a comprehensive note on the condition of Purnea Cattle after making an extensive tour in the district. In the same year he was elected as the Secretary to the Live-stock Section of the Bihar & Orissa Provincial Exhibition held at Patna, under the distinguished presidentship of Hon'ble. Sir Walter Maud. K. C. S. I., I. C. S., C. S. I. Soon after this, Mr. Das was promoted to the Gazetted rank.

In 1920, he was entrusted with the work of compiling a note on "Flaying of Goats alive" which was published by the Bihar & Orissa Government with photos and diagrams and the Government was so much pleased with this work, that they granted him a substantial honorarium. In 1922, Mr. Das took his Post-Graduate course of studies at the Muktesar Institute. He was singled out to be promoted to the Imperial Veterinary Service, but the Lee Commission Report which stopped further recruitment to that Service, stood in his way. On the New Year's day of the same year, the Government were pleased to confer on him the title of Rai Sahib in recognition of his good services to the Government.

It was due to Mr. Das's initiative that the Bihar and Orissa Veterinary Association came into existence and he continued to be its President till the day of his retirement. He held the Presidentship of the All-India Veterinary Association for 1924-1925.

After the lamentable demise of Capt. Howard under tragic circumstances, our Rai Sahib succeeded him in Orissa Range and continued to be there till the day of his retirement.

During the later years of service he published his findings on "Nasal Granuloma..' He was a popular figure in Co-operative fields and Gorakshini Sabhas. His Presidential address for the improvement of cattle was extracted in 'Young India' with a favourable editorial comment by Mr. M. K. Gandhi.

After nearly 32 years of service, Rai Sahib P. N, Das, retired on 14th May 1932, when he was given a send off worthy of his position and splendid services rendered to the State.

May he be spared long to enjoy his well earned rest!

SOMETHING TO REMEMBER.

At a meeting of the Animal Husbandry wing of the Board of Agriculture and Animal Industry, Dewan Bahadur Sir T. Vijayaraghavacharya, its Vice-chairman said that certain figures had been supplied to him, and from them he gathered that India possessed 300 millions of domesticated animals and the very next country, the United States, possessed 180 millions. That was a very impressive figure, but when he looked at the figures of expenditure on animal husbandry, he found that India took a very low place. Worked out to a per capita rate, India spent, both centrally and provincially, a sum of six pies per head on animal husbandry. The figure for the United States exceeded one rupee. He, therefore, thought that that represented the need for animal husbandry work, the need for propaganda work, the need for drawing attention to the great importance of live-stock and the necessity for adequate financing of it. India had certain very good breeds of cattle which, if properly developed, would become some of the finest breeds in the world. He did not doubt that there was a very wide field for improvement in stock. The great problems were, however, those of animal health and nutrition. Recent experiments had shown that, apart from the veterinary work, the actual treatment of sick animals, proper diet and proper nutrition, apart from insuring proper development, would help to insure Indian cattle against a large number of diseases that now attacked them. The importance, therefore, of a thorough investigation of animal nutrition could not be overemphasised.

THE 135TH MAN.

We were under the impression that we have outlived the days of gross favouritism and grave injustice in the history of Public Services in India. But we find we were in a fool's paradise. A case of nepotism of the first magnitude has been practised with impunity in the Civil Veterinary Department, Madras. The tale is only to be told to realise the enormity of the heartless injustice that has been perpetrated on 134 hard-working seniors in that department. The so-called "safe-guards" in the form of Public Services Commission, Eligibility list, Selection Grade, Communal Rotation, etc., etc., have all been cast to the winds. It is a glaring instance of how the good intentions of even a mighty Government can be set at naught by its own subordinates, if they are only so inclined. The Government itself feels helpless before such paragons of Public Virtue! Let us now get to facts.

For the post of the Disease Investigation Officer in the Presidency of Madras, a person who occupies the 135th place in the establishment list of the *Ordinary* subordinate cadre has been preferred to so many of his seniors, some of whom in the *Selection* grade with brilliant records of service to their credit.

On one fine morning, the Director of Veterinary Services, Madras rose to find in this 135th man, all qualifications necessary to fill in the post of the Disease Investigation Officer. The pity of it was that he tried hard to find another amongst nearly 300 of his subordinates, both gazetted and non-gazetted, but there was none to approach anywhere near the subject of his final choice! He immediately wrote and informed the Government of his great find and said that the only man he could think of as best suited for the post was this 135th gentleman!

The Government looked in amazement! They wondered if that could be a fact! They could not understand how amongst 134 seniors and about 20 District Veterinary Officers, there is not a single man to take up after all not any work of Research, but a field investigation of diseases, as much as this junior! They said to themselves what had come upon the Madras Civil Veterinary Department to become so bankrupt of talent! They rubbed their eyes and read the Director's recommendation once again. They searched in vain for the usual restraint in language generally associated with men in responsible position. But no! The Director's recommendation was an unqualified assertion. The wrath of the Government was up. Their sense of justice was outraged and immediately went forth the reply to the Director that the candidate was far too a junior to be seriously thought of, particularly when there are a few at least amongst the seniors who are duly qualified for the post.

But the Director stuck on to his original proposal. The matter was referred to the Public Services Commission and they said that recruitment of this 135th man was impossible under the Statutory rules and that they could not find their way to agree to the proposal of the Director. At this stage a strange innovation seems to have come upon the Government itself. Their sense of justice had watered down a good deal. Their wrath was now one of smiles. They swallowed down their own previous statements, shifted from their original position and decided to recruit this 135th gentleman on a ***contract basis*** to overcome all difficulties. From this time onwards the Government was out-heroding Herod. They began championing the cause of this 135th gentleman even more than the Director, who at a later stage, it is said, recommended the name of an Indian M.R.C.V.S., Officer already in gazetted rank.

The profession which was till then depending on the sense of justice of the Government and the Departmental head, thought that the time had arrived to move in the matter. The Madras Veterinary Assistant Surgeons' Service Association sent in a memorial to the Hon'ble Minister through the head of the Department, pointing out the injustice involved if a junior was recruited for the post and recording the feelings of the profession on the question and requesting the Government to consider the claims of Seniors in the department with equal and even better qualifications for the post. At the same time a few of the kindly Members of the Legislative Council warned the Government of the grave danger to the sense of security in Government Service, of justice and of fair-play, if such a hap-hazard selection is made through circumvention of Rules and Regulations. The Hon'ble Minister had to face a volley of questions on the floor of the Legislative Council and he said in reply that the question of appointing a suitable candidate to the post was still under the consideration of the Government and that he would bear in mind all the facts brought to his notice and do justice in the matter. But notions of justice seem to vary with positions in life. Men of commoner clay like ourselves are unable to understand the 'justice' meted out by the exalted Minister in appointing the self-same gentleman against whom there was so much of opposition! A fine opportunity of enhancing the reputation of his administration, of proving his mettle, of doing a bare piece of justice and of avoiding a slur on his tenure of office has been lost by the Hon'ble Minister.

We now crave the indulgence of our readers to examine in a few lines, if this 135th gentleman is really so highly qualified as to deserve the greatness that has been thrust on him. He is a gentleman who passed out of the Madras Veterinary College taking full five years to get through the course, when the prescribed period is only three years, while almost all of his condemned seniors got their diploma within the prescribed time perhaps—it may be said—by a fluke. It is likely that the learned Director considered this as an additional qualification in the man! Having taken up his hard-earned diploma, he just served only for a few months in the field, when he took up an appointment as Veterinary Inspector at Muktesar, where we fear he remained for about a year. On return to his native presidency he got himself attached to the Laboratory at the Madras Veterinary College and he was one amongst the six or seven assistants working over there. Naturally the work was divided amongst them. Doing nothing beyond the laboratory routine such as examination of a few slides, being in charge of stores, despatch of Rinderpest Virus, etc., our readers can well realise that his career at the laboratory was such that it does not merit much mention here.

He is just a junior with barely 11 years of service and without any field experience worth the name. In the ordinary course of events in the department he would not have had his chance to be in charge of a hospital even. He had not even reached the top of the lowest grade in the Department. He has no extra qualification either in the form of a diploma or degree over and above his condemned seniors. The only qualification if it could be so called without abusing the English language is his 'sojourn' to England for about four or five months. Such short 'sojourns' are designated in India as "Post-Graduate Studies in England" (what a misnomer!) and much store is set upon them. Any body who could beg, borrow or steal or command a few thousands of rupees, whether he has the necessary aptitude or not, whether he has the necessary merit, experience and brilliance or not, can as per a glorious Government Order recently solemnised by the Madras Government claim by right the post of a Lecturer at the Madras Veterinary College. We thought this absurdity was being restricted to the Madras Veterinary College and we only deplored the fate of future men who will be trained at the hands of such "Professors." But now we find such 'sojourns' are considered seriously for even executive posts in the Department. This 135th gentleman has thus in the eyes of the Director and through him the Government of Madras suddenly qualified himself for the post by his short 'sojourn' to England!

Let us see what a savant of the profession, Col. A. Olver, C.B., C.M.G., F.R. C.V,S., Expert Adviser in Animal Husbandry to the Government of India has said about this disease investigation work in his presidential address at the 7th All-India Veterinary Conference at Bangalore. "*There appears to have been a tendency to regard anything in the nature of investigation as a matter beyond the capacity or interest of any but those who are employed in large research instituiions, and I want to impress upon yon all that a great deal of most valuable information, regarding, the diseases from which the live-stock in every province suffer, can be obtained by anyone who will make careful clinical observations and thorough post-mortem examination whenever an opportunity occurs, thus collecting material for further investigation.*"

Thus it would be seen that a senior officer with vast field experience and a fair knowledge of laboratory technique would have been the best choice. There are heaps and heeps of such men in the department. Nowhere has it been stated that the so called Post-graduate studies in England are neccssary for the post of the Disease Investigation Officer.

Even if it be so, there are so many seniors in gazetted rank with full foreign qualifications such as M. R. C. V. S., D. V. M., M. Sc., etc., etc., who could have been recruited for the post and their place would have gone to a senior and there would not have been such an outburst of feelings in the department. Again this Disease investigation work is more a continuation of the post of the Special Rinderpest Officer. When a senior officer could be found fit to investigate into that worst scourge of cattle in the self-same presidency fot the last two years with very good results, why should it now be considered as absolutely necessary to recruit this 135th gentleman for this post? Echo answers why?

In any case to taboo a long list of seniors as unfit for this taskf some of whom with longer laboratory experience, brilliant records o admirable service and better fitted in every sense for this field work, is the height of unfairness that can be extended to any class of devoted and loyal servants of the Crown.

The profession looked up in vain to the Government to render them the barest of justice. They begged of them not to depend on the bare and bald statement of an individual officer. They requested them not to take shelter under the plea of following an Expert's advice. They appealed to them to get into the merits of the case and sit in judgment without favour or prejudice. Bur all that was in vain.

Well, it is no use of arguing with people who revel and persist in their folly even when pointed out; people who have eyes and yet do not want to see; people who cannot realise that such deeds will undermine the morale of the service and people who forget how miserable they themselves felt and ran from pillar to post when their claims for higher posts were at jeopardy, perhaps not without some reason.

We have absolutely nothing against the person of this 135th gentleman. He is just as much a friend of ours as so many of our professional colleagues in this presidency and elsewhere. But a wrong of such magnitude perpetrated against so many of our professional brothers in service, who have flooded our office with heart-rending letters cannot go unrepresented in our pages. Our purpose in writing on this subject in such detail is to invite the attention of the public at large to the fact that it must be made impossible in future at least for such individual idiosyncracies to run amuck in official service.

In this unfortunate episode, the rank and file of the profession in Madras have nothing to be ashamed of. Their methods have been absolutely over and above board. They took to the most approved

methods of constitutional agitation, which are possible for men in Government service. But poor men! They were arrayed against great odds which we do not want to detail here for the present. But they have done their duty.

" Though the mills of God grind slowly.

Yet they grind exceedingly small".

Original Articles.

DISCOVERY OF THE CAUSE OF NASAL GRANULOMA IN CATTLE.

PRELIMINARY REPORT

BY

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Nasal Granuloma is a serious chronic disease of cattle characterised by mucopurulent or sanguinolent discharge from the nostrils and the appearance there of cauliflower-like growths which by obstructing the nasal passages cause considerable respiratory distress to the affected animals and give rise to the production of the characteristic snoring noise from which the disease is colloquially called "Sunsuna". The disease has so far been recorded only in India and even there its incidence is strictly restricted to certain provinces e.g. Bombay, Madras, Assam, Bihar and Orissa, Mysore and Central Provinces.

HISTORY OF THE DISEASE.

The disease appears to have been recognised in India for a great many years. One correspondent from Manbhum writes to say that the existence of the disease has been known there for over a century. The earliest contribution to the literatue of the subject however appears to be that of Jeya Singh Raj (15) in 1910, who reported the occurrence of this disease in Madras Presidency.

Parthasarathi Naidu (26) in 1921, published the next earliest contribution on the disease. This author reported having used tartar emetic with such success that he was inclined to regard the drug as a specific for the disease.

. Krishnamurti (17, 18) between the years 1922 and 1925 published a series of papers on this subject. In these he described in detail the histopathology of the masses of granulation tissue in the nasal cavities and drew attention to the constant presence in sections of acid and alcohol-fast Granule masses " many of which could be readily seen to be composed of radiating elements the so-called 'rays' or ' Clubs '—very closely simulating those found in Actinomycosis." This author presumed that these Granule masses represented " the colonies of the causal organism ". But noting some striking differences between Nasal Granuloma and the common Bovine Actinomy-

cosis he concluded that the causal agent of Nasal Granuloma must be closely allied to those of actinomycosis. He was, it seems, unsuccessful in transmitting the disease from affected to healthy animals by all known artificial methods. He appears to have also tested the efficacy of tartar emetic and came to the conclusion that the drug had no curative value in this disease. In 1927, however (19), he appears to have found that some cases of Nasal Granuloma were definitely associated with Rhinosporidium and as a result of this he opined that it might yet " be possible to correlate all the lesions found in cattle including those at present believed to be due to streptothrix organism, with Rhinosporidium as their cause ".

Cooper (7, 8, 9) studied Nasal Granuloma at Muktesar at different times between 1923 and 1931. He confirmed Krishnamurti's histological finding and further reported that he had succeeded in repeatedly isolating, from the lesions, a pure culture of an organism belonging to the Streptothrix group of bacteria. He also carried out several transmission experiments both with morbid material from affected animals and with pure cultures of the isolated streptothrix organism but obtained uniformly negative results. He noted that in staining affinities the Granule masses differed " from the streptothrix actinomyces in being quite Gram-negative " and that " none of the other recognised methods of staining actinomyces " brought out " further points of resemblance " and accordingly concluded that a " Ray Fungus " related to the classical actinomyces was the cause of Nasal Granuloma.

Das (10) in 1929 published the results of his experiments on the transmission and treatment of the disease, carried out in Bihar and Orissa. He confirmed that the disease could not be transmitted from animal to animal either through the agencies of soil, fodder, water or nose strings or by "subcutaneous, submucous or intravenous injection of diseased material." He proved the utter inefficacy of Potassium iodide as a therapeutic measure against the disease and gave convincing proof of the curative value of tartar emetic which had been suggested by Parthasarathi Naidu as a specific against this disease.

Edwards (12) in his comments on the results of Das' experiments drew attention of the rather significant failure of potassium iodide which usually has a " pronounced effect upon the clinically similar condition Actinomycosis " and opined that this might be an indication "that the condition" " was" "not in reality a streptothricosis, in spite of the fact that granules apparently indistinguishable from those of actinomycosis " were discoverable in the lesions. He further suggested a system of treatment for the disease analogous to

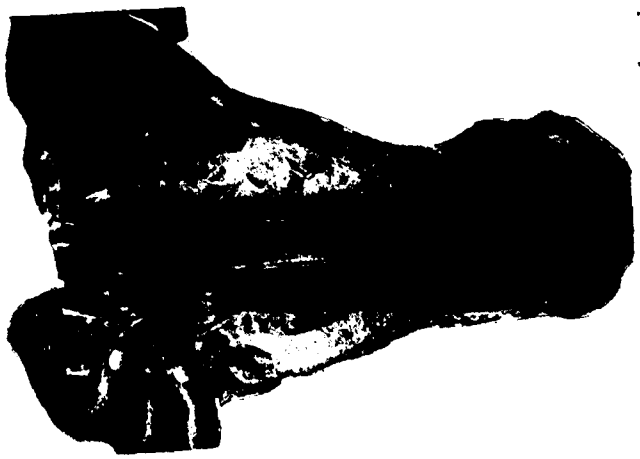

Fig. 2. Interior of the nasal fossae exposed to show the cauliflower-like lesions on the turbinated bones, alae nasi and the nasal septum.

Fig. 1. Bullock suffering from Nasal Granuloma. Note the nasal discharge.

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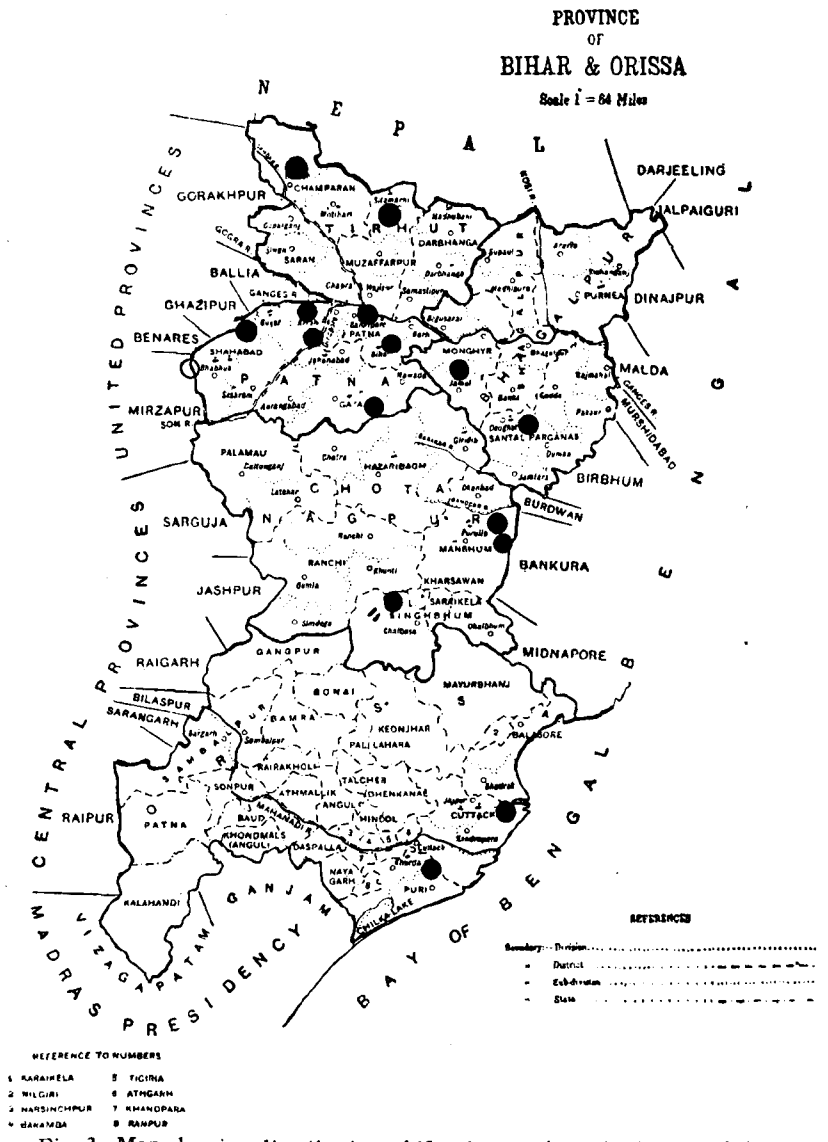

Fig. 3. Map showing distribution of Nasal Granuloma in Bihar & Orissa. The black circles represent the areas in which Nasal Granuloma is known to occur.

the one "adopted in human schistosomiasis (bilharziasis)". The present discovery adds great interest to this suggestion for it shows how very near this commentator had got to the truth.

Oxspring (25) in 1931, studied in collaboration with Cooper an outbreak of Nasal Granuloma in Jubbulpore. He reported that treatment with tartar emetic was very successful and that "an organism of the streptothrix group very similar to streptothrix actinomyces" could "always be found in the lesions and" was "probably responsible for the disease." About the same time Cooper (9) appears to have re-considered his earlier views on the etiology of Nasal Granuloma and come to the conclusion that "since the disease is definitely amenable to treatment with Tartar Emetic and this drug is of great value in the treatment of some protozoan affections such as Kala Azar and Surra, it is reasonable to suppose that Bovine Nasal Granuloma may be due in reality to a protozoan organism."

This account brings the review of the history of Nasal Granuloma in cattle down to the present period. The object of this paper is to record the already promised* (23) details of the author's work which has shown that the actinomycotic theory is no longer tenable and that Nasal Granuloma in Cattle is a form of Schistosomiasis.

General Features of the Disease.

The disease usually manifests itself by frequent sneezing and a thick mucous discharge from the nostrils (fig. 1). At this stage the breathing is somewhat embarrassed and examination of the nostrils reveals the presence in some places of irregular areas of congestion and in others of pimply eruptions. As the disease advances the discharge becomes fætid, mucopurulent and sanguinolent, the sneezing becomes more frequent and the breathing is attended with a characteristic snoring noise which is more marked when the animal is grazing. Examination of the nostrils at this stage shows that some of the previous pimply eruptions have become confluent causing a diffuse uneven thickening of the underlying mucous membrane while others have grown into cauliflower-like masses of very vascular granulation tissue in the centre of many of which yellow necrotic foci can be seen (fig. 2.) These lesions appear to extend from the

*On account of the great importance of this discovery both for the cattle owners and contemporary workers a brief announcement of it had to be made by means of a popular public lecture delivered on 18th February, 1932 under the Presidentship of Mr. R. T. Davis, Principal, Bihar and Orissa Veterinary College, Patna. This lecture was reviewed in the Indian Nation 13th March, 1932 and the Indian Veterinary Journal (Vol. VIII-No. 4) April, 1932. A short preliminary note was also published in the Veterinary Record of 9th April, 1932 and it was in this communication that the publication at a later date of the full details of the work was promised.

anterior nares to nearly the middle of the nasal cavity and can be felt on the nasal septum, the turbinated bones and the alæ nasi. After a time such growths usually undergo disintegration and are discharged through the nostrils leaving behind raw ulcerated surfaces up to 8 anna piece in size, which are easily seen at the entrance of nostrils. When this occurs the animal is greatly relieved of its embarrassing symptoms but this relief is only temporary because the lesions once again increase in size and snoring re-appears. Such temporary relief also follows surgical removal of the growths which is attended with much hæmorrhage. Observation at this laboratory has further revealed in some cases a rather notable swelling of the superficial lymphatic glands viz. cervical, prescapular and inguinal. In other cases it has been noticed that there are intermittent attacks of polyuria and sexual excitment probably coinciding with the time when this disease is at its height. There is no other constitutional disturbance. The disease lasts for a long time in the animal and is seldom fatal but by rendering animals unfit for work in the plough and producing loss of condition and diminution in milk yield it causes great annoyance and economic loss to the cultivator.

Nasal Granuloma has not been reported from other parts of the world and appears to be confined to India where it is found principally in Burma, Bengal, Bombay, Bihar and Orissa, Madras, Mysore and the Central Provinces. Even in these provinces the disease shows a curious regional distribution being restricted to low lying marshy localities, which are either irrigated with canal water throughout the year or suffer from inundation during the rains. Its distribution in this province has been fairly fully worked out from the replies to a questionnaire sent out from this laboratory (fig. 3). It is most prevalent in the districts of Patna, Shahabad and Gaya.

In addition to this strictly regional occurrence the disease is characterised by being remarkably seasonal in appearance. Evidence goes to show that fresh cases only occur during the rainy season and that at this time old cases usually become aggravated while during the spring and summer there is definite amelioration of the symptoms.

Further, among cattle there does not appear to be any marked difference in susceptibility to Nasal Granuloma. All breeds of cattle and both sexes are equally affected. It has however been noted that animals below one year usually do not suffer from the disease probably because they are never sent out to graze.

Nasal Granuloma in Buffaloes.

Perusal of available literature and replies to the questionnaire issued from this laboratory, shows that most of the investigators and

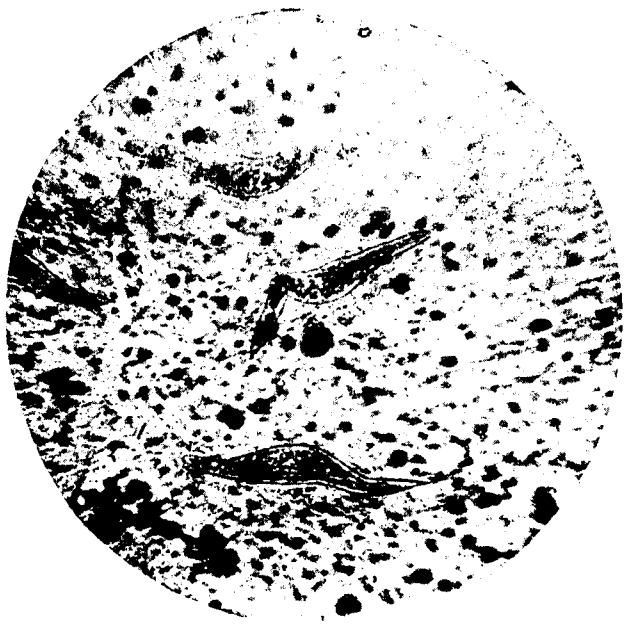

Fig. 5. Cover glass preparation of the nasal discharge from a bullock suffering from Nasal Granuloma, showing characteristic eggs.

Fig. 4. Buffalo suffering from Nasal Granuloma.

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Fig. 5. Ovum of Schistosome spindalis Montgomery, 1906, x 200 ; (after montgomery.)

Fig. 6. Cover glass preparation of the nasal discharge showing an egg that has split and liberated the embryo.

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workers in the field believe that Nasal Granuloma does not occur in buffaloes. There are some observers, however, notably Mr. R. K. Ram, Veterinary Inspector, Chaibasa and Prof. G. N. Roy Choudhuri who have informed the author that they have seen in these animals rare cases of a disease clinically indistinguishable from Nasal Granuloma in Cattle. At the time of writing the present author has been afforded an opportunity of confirming these clinical observations by microscopic examination of the Nasal discharge from a case of Nasal Granuloma in a buffalo (Fig. 4) which was sent to the laboratory by Mr. Md. Azam, Veterinary Assistant Surgeon, Veterinary Hospital, Bankipore under instructions from Mr. R. K. Ram. This examination revealed the presence in abundance of Schistosome eggs which were all of one type and were indistinguishable from those seen in the case of Cattle. It may therefore be laid down as once for all settled that Nasal Granuloma does occur in Buffaloes. Particulars of the disease as it occurs in these animals will be described in another contribution.

AETIOLOGY.

Ever since the disease was brought to the notice of Veterinary profession, its etiology seems to have engaged the attention of every investigator. This has resulted in the formulation of various theories. Cold, cough, and irritation during thrashing have been individually and collectively accused at different times. The nose string has had a good deal of guilt attributed to it. As these fanciful speculations of earlier workers have very obvious obstacles in the way of acceptance it is not proposed to give them any further consideration. The Actinomycotic theory however was more plausible and attracted great attention among investigators on this disease. For this reason it is proposed to consider its pros and cons in detail. Similarly before discussing the new theory it is proposed to criticise briefly the Rhinosporidium theory which has recently been suggested by Krishnamurti (19) as more likely to replace his earlier actinomycotic theory.

ACTINOMYCOTIC THEORY.

This theory was first put forward by Krishnamurti (18) and later supported by Cooper (7, 8) and Oxspring (25). The direct evidence adduced by these workers brings out two points. All of them have discovered what they allege to be acid and alcohol-fast "Granules and club" formations, resembling those of actinomyces, in sections of growths removed from affected animals. Further one of these authors, Cooper (7, 8), claims to have succeeded in repeatedly isolating from the lesions a pure culture of an organism of the streptothrix group of bacteria.

There are however serious obstacles in the way of accepting this theory. The present discovery and the work of other investigators, notably Beaver (2), Yamagiwa (30), have made it abundantly clear that Club like' formations can be met with in both bacterial and helminthic infections and are therefore not to be regarded as specific evidence of infection with organisms of the streptothrix group. Apart from this there is a striking difference between the structure of granules of Nasal Granuloma and those of Actinomyces. Whereas in Nasal Granuloma the granules are definitely Gram-negative, and it has so far been impossible to demonstrate any micro-organism within them, the Granules in Actinomycosis usually show distinctly gram-positive organisms and filaments in their centre. Further the so-called rays or 'clubs' in the Granule masses of Nasal Granuloma emanate from " what seems to be a kind of basal membrane " surrounding a central space which is usually a hollow cavity and only occasionally "occupied with granular detritus and pus cells ", in typical Actinomycosis granules there is no such central hollow core. Krishnamurti (18) considers this central cavity as being " not improbably due to shrinkage of the radiating elements during fixation of the tissues for histological examination or to the contraction or elimination of the purulent matter in which the granules are embedded." Later on it will however be shown that this central cavity represents the space formerly occupied by the egg ; that the 'granular detritus and pus cells ' sometimes seen in it represent the nuclei of the body cells of the larva that was enclosed in the egg, while the clubs are merely masses of eosinophile cells attracted to the vicinity of the egg in response to the specific toxin liberated by the larva.

There are still other important differences between Nasal Granuloma and Actinomycosis. In Nasal Granuloma the lesions are exclusively situated in the nasal mucosa and never attack the tissues of the tongue and the jaw, quite the reverse is the case in Actinomycosis. Similarly experience in the field and experiments in the laboratory have shown that Nasal Granuloma does not yield to treatment with potassium iodide which is a well known specific against Actinomycosis. Further, all attempts by previous workers, to transmit the disease by administering in various ways all sorts of morbid material and even the alleged isolated streptothrix organism to healthy animals, have been uniformly unsuccessful and this has been abundantly confirmed by the results of many transmission experiments carried out at this laboratory. Again, study of the geographical distribution of these two diseases also shows a difference. Actinomycosis is very common in Europe and very rare in India.

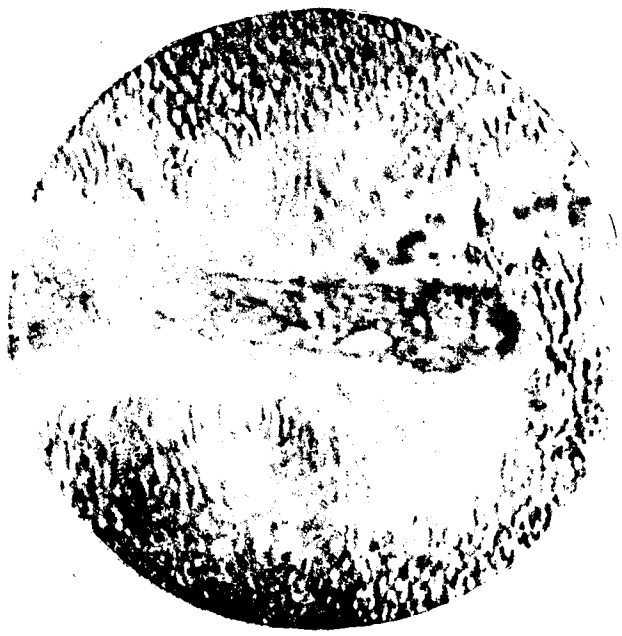

Fig. 9. Cover glass preparation from the nasal discharge of a case of Nasal Granuloma showing a free miracidium.

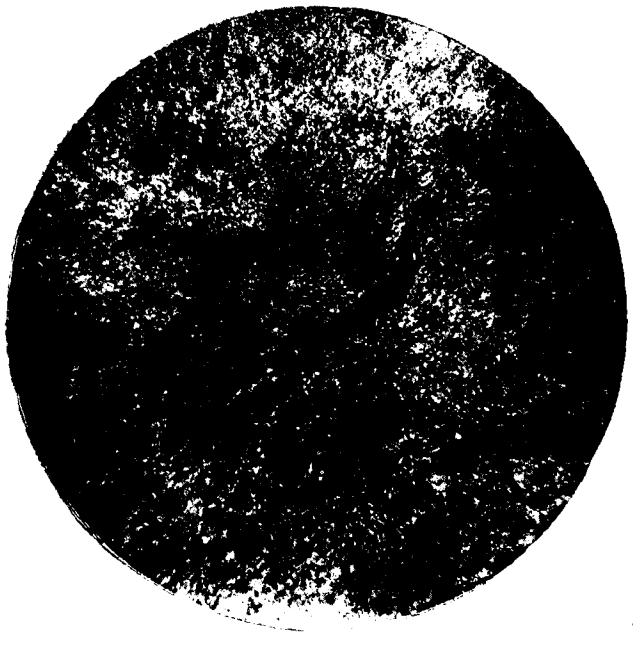

Fig. 8, Cover glass preparation of the nasal discharge from a case of Nasal Granuloma in a buffalo showing the eggs. Note the similarity of eggs with those seen in the case of the bullock.

To illustrate the article on Nasal Granuloma in cattle by Prof. P. G. Malkani, Page 257.

Fig. 11. Section of a growth showing the follicles.

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Fig. 10. Section of a growth from the nasal chambers showing the ulcerated surface.

Nasal Granuloma on the other hand is mainly confined to India and has never been reported from any European country.

Such notable differences in histological structure, predilection seats, response to specific treatment and geographical distribution together with the remarkably uniform failures in transmission experiments render it highly improbable that an actinomyces-like fungus has any etiological significance in Nasal Granuloma. Indeed Krishnamurti (19) himself appears to have shown great uncertainty about the correctness of his earlier Actinomycotic views by suggesting Rhinosporidium as the probable causative organism. Similarly Cooper (9) in 1931 appears to have abandoned this hypothesis in favour of an equally untenable protozoan one. The findings incorporated in this paper now show definitely that this theory is no longer tenable.

Rhinosporidium Hypothesis.

The suggestion that it "may yet be possible to correlate all lesions found in cattle including those at present believed to be due to streptothrix organism with Rhinossoridium as their cause" was first put forward by Krishnamurti (19) in 1927. He appears to have based this suggestion mainly on the finding that some cases of Nasal Granuloma in cattle were definitely caused by Rhinosporidium and the clinical history of snoring disease resembled that of this disease in human beings. There is however not much justification for such a suggestion. For even if future research confirms the alleged occurrence of bovine Rhinosporidiosis in India, the lesions and histology as described by Krishnamurti himself are so different from those of Nasal Granuloma as to preclude the possibility of these diseases being identical. Further it will be shown later how as a result of the present discovery Nasal Granuloma can be definitely distinguished from any other disease by means of microscopic examination of the nasal discharge.

The New Theory (Schistosomiasis).

Work on Nasal Granuloma has occupied some of the present author's time during last year (1931). The material for this work was obtained from three affected animals which were purchased for the laboratory in October, 1931. Some material was also supplied by the staff veterinary surgeons of the Province. In addition clinical observations were carried out on over a hundred cases that visited the hospital as out-patients. As a result of this work the author has come to the definite conclusion that Nasal Granuloma is nothing else but Nasal Schistosomiasis, the species of Schistosoma responsible for the condition being either *Schistosoma spindalis* Montgomery,

1906, or a very closely related species. This view is based on the evidence afforded by :—

(1) The discovery of the characteristic spindle-shaped eggs and ciliated embryos (miracidia) in direct cover glass preparations of the nasal discharge of all affected animals ;

(2) The discovery of sections of Schistosomes and their eggs during histopathological study of morbid growths as well as the recovery of damaged adults from such growths ;

(3) The recovery of adult Schistosomes with the same characteristic eggs during postmortem examination.

Examination of the Nasal Discharge.

For the purpose of this investigation some samples of the nasal discharge were obtained from the three cases maintained at the laboratory, a few were obtained during field work and others were obtained from over a hundred cases that visited the hospital as out-patients.

As already stated the nasal discharge, when the disease is established, besides being mucopurulent is sanguinolent and usually contains some blood clots. Microscopic examination of direct cover-slip preparations from every sample of such a discharge, specially after it has been somewhat thinned with ordinary tap water or sodium citrate solution, reveals among the blood corpuscles and other catarrahal products, the presence of a large number of eggs *all of which are of one type* and resemble the eggs of *Schistosoma spindalis* Montgomery, 1906 (fig. 5). It might be mentioned here that although these eggs can be found in all portions of the discharge they appear to be most numerous in blood clots in which they occur in entangled masses. Some of the eggs seen are immature showing various stages of segmentation of their contents ; others are fully mature containing within them actively motile ciliated embryos which can be seen to be distinctly enclosed in a vitalline membrane. Some of the ova can be actually seen to split longitudinally liberating the enclosed miracidia. (fig. 6). The consensus of opinion among workers on bilharziasis appears to be that miracidia are only set free when the eggs come in contact with water. The present work of the author has however shown that this is not always so. In the nasal discharge specially from animals showing acute symptoms one can find miracidia without the addition of water or the pressure of a coverslip. Preparations from the buffalo seemed to be specially rich in miracidia and empty shells of eggs, Besides the mature and immature eggs one finds others whose shells are somewhat shrunken

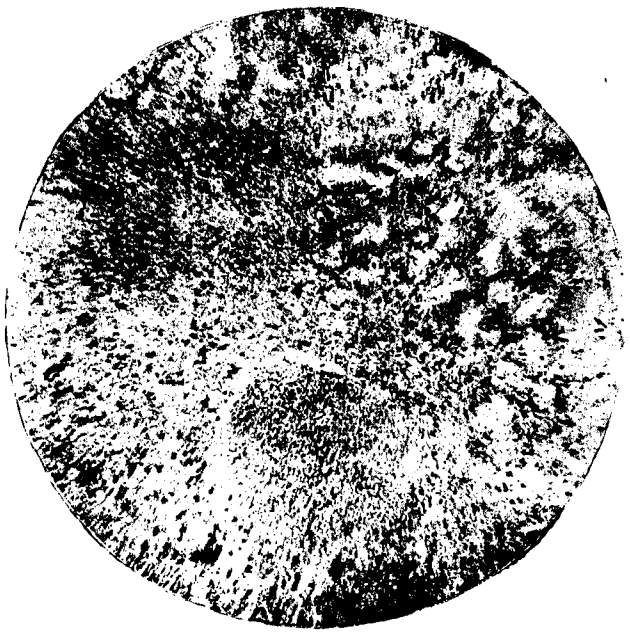

Fig. 13. Section of a growth showing an Eosinophile abscess.

Fig. 12. Section of a growth showing the concentration of Eosinophiles round a cavity occupied by an egg in which a well defined embryo can be seen.

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and whose contents are black and amorphous. Such eggs are found specially in cases in which the lesions have retrogressed either naturally or as a result of treatment, and no doubt represent as suggested by Christopherson (4, 5,) ova that have died either as a result of tissue reaction or the lethal effect of the sepecific drug.

The ova as seen in the nasal discharge resemble those of *Schistosoma Spindalis* Montgomery, 1906, in being greatly elongate, spindle shaped (fig. 7). They possess a well defined cuticle which at one end is bluntly rounded and at the other forms a spine which is not quite sharp, has a rounded tip and is slightly bent ventrally. Viewed in the lateral position the egg may be said to have the form of a triangle the lower border of which instead of being straight as is the case in the ova of *Schistosoma spindalis* Montgomery, 1906, is definitely concave the concavity varying from a slight to a deep one so that the egg has the appearancc of Napolean's hat. In length the immature ova in which the embryo is not defined measures from 332 μ to 392 μ long (inclusive of spine) and from 41·5 μ to 67 μ broad. Mature ova containing fully developed embroys measure from 400 to 581 μ long. In width they measure 67 μ to 83 μ across the bulged portion. The spine in the majority of cases varies from 3·3 μ to 9·9 μ. In one case it was found to be 11·5 μ and in another 13·2 μ. It has been found that the more mature the ovum, the less is the length of the spine. This appears to be the case in all schistosomes. The ova seen in the nasal discharge from buffaloes are exactly like those seen in cattle both in appearance and dimensions (Fig. 8.)

The addition of water to the nasal discharge rapidly brings about in mature ova, from which miracidia have not already escaped, vacuolation between the shell and the embryo which soon shows vitality by repeated jerky movements. It soon becomes surrounded by vacuoles discharged from its body and as a result of rapid ciliary movement these vacuoles also show active and vibratile movements. After some time the shell in some of the ova is seen to split in a longitudinal direction and the embryo is liberated. The liberated embryo (Fig. 9) is somewhat pearshaped, the blunt extremity bearing the cephalic prolongation. It measures from 98·4 μ to 224 μ in length, according to the state of contraction and extension, 49 μ to 83μ in breadth at the broadest part. The whole of the outer surface, with the exception of the minute papillary beak, is very thickly provided with backwardly directed fine cilia about 8μ in length. This ciliated embryo swims and gyrates very actively and readily changes its shapes by various contractions of its body. In a coverslip preparation it can be readily seen that the embryo when it

Fig. 15. Section of a growth showing transverse sections of the parasites (male and female in copula) in situ.

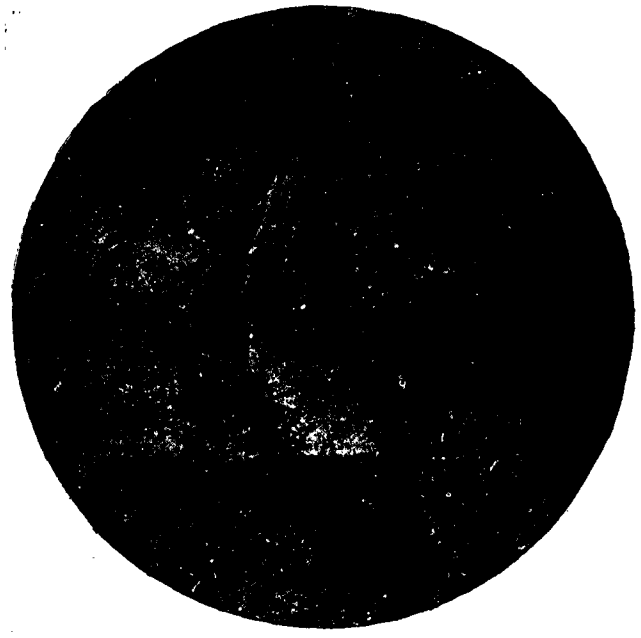

Fig. 14. Section of a growth showing the empty space which bears close resemblance to the characteristic eggs seen in the nasal discharge.

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comes against any obstruction tries to bore its way with the anterior extremity which carries the protrusible terminal stilet.

The anterior extremity carries the stunted blunt head. A fine canal runs from this, enters a saccular dilatation the so-called rudimentary stomach. On either side of this rudimentary stomach there appears to be a small gland-like organ from which a delicate duct passes forward to open some where in the neighbourhood of the beak. The rest of the body of the larva is filled with a number of sarcode droplets.

The miracidium found in the case of buffalo does not differ from that seen in cattle.

Examination of Urine.

Several specimens of urine from affected animals have been centrifugalised and examined but so far in no case have any schistosome eggs been found. The urine is usually quite clear without any catarrh or blood. In some cases bile pigments have been observed in samples of urine.

Examination of Fæces.

Examination of the fæces has been carried out by direct cover-slip preparation and by the sugar floatation method. In addition to this portions of the rectal mucosa snipped off the rectum as in Johne's disease have been teased in normal saline and examined. Such examination has so far failed, in both cattle and buffaloes, to reveal any eggs of the spindalis type, but on some occasions eggs indistinguishable from those of the *Schistosoma bomfordi* Montgomery 1906, have been found. The appearance of these eggs in the fæces is due to the fact that as revealed by postmortem examination, an animal affected with nasal schistosomiasis appears also to harbour other species of schistosomes the eggs of which seem to select the rectal mucosa for their exit from the definitive host. The absence of the spindle shaped egg from the fæces of the affected animals must constitute an important difference, among others, between the parasite of Nasal Granuloma and schistosoma spindalis because, the eggs of the latter as shown by the work of Montgomery (24) and Liston and Soparkar (22) are usually voided with the fæces.

Examination of the Blood.

Examination of the blood smears from affected animals is uniformly negative for bacterial or protozoan parasites but always reveals an excessive eosinophilia. The most noteworthy phenomenon that has been seen at this laboratory is in connection with the clotting of the blood taken from affected animals. When the

Fig. 17. Section of a growth showing endarteritis.

Fig. 16. Section of a growth showing rupture of the vessel containing the parasites (male and female in copula.)

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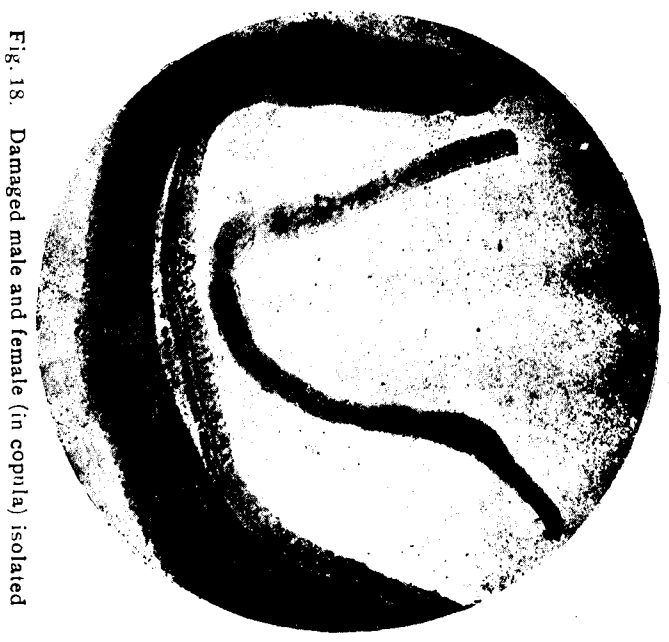

Fig. 18. Damaged male and female (in copula) isolated by teasing the growths.

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blood is collected from the jugular into a test tube it appears to clot quite normally but the clot does not retract with the result that no serum is expressed even after three days in the worst affected animals. This inability of the clot to retract has been observed only in the affected animals and has not been seen in the case of others. Further it also appears to be directly proportional to the severity of the disease being very marked in the animal that is most affected and just noticeable in the animal that is least affected. These findings require further study. A similar phenomenon is observed in one of the human diseases at present grouped under the so-called Hæmorrhagic diatheses, namely Wrelhoeff's disease, in which as a result of the thrombocytopaenia although the coagulation rate is normal the clot fails to retract.

Histopathological Studies.

Morbid material for author's histopathological studies was obtained mostly from the three affected animals maintained at the laboratory. A few growths were removed from cases in the field by the laboratory staff and a few others were submitted to the author for examination by the veterinary staff of the province.

Inspection.

The growths dissected out from the nostrils are usually very soft and friable and are greyish-red in colour. Examination of the base of these growths shows that they must have been intimately adherent to the nasal mucosa. Their outer surface shows few black points and is very irregular. At some places it shows definite signs of ulcerative destruction while at others it presents a distintly worm-eaten appearance. These large growths are usually lobulated, cauliflower-like, and frequently attain the size of a walnut. On closer examination they are found to be composed of densely packed smaller nodules varying in size from a millet seed to a large pea. Many of the large growths show necrotic foci externally and when incised show in their interior a varying number of minute abscesses.

Morbid Histology.

Examination of sections of such growths reveals a typical picture of highly vascular granulation tissue formed as a result of chronic inflammation of the submucous and mucous layers of the nose. One finds evidence of the irritant and the many degenerative changes caused by it such as congestion, cloudy swelling, fatty degeneration, necrosis, minute ulcers and abscesses, together with marked cellular infiltration for the purpose of removing the irritant or delimiting its activities and proliferation of fibroblasts and vascu-

lar endothelium to replace destroyed blood vessels and connective tissue and to organise the fibrin. The composition of this granulation tissue varies with the age of the growth. Early growths are mainly composed of young vascular tissue while in older growths dense fibrous tissue preponderates.

Outwardly the continuity of the epithelial lining is broken at places by ulcerated areas which are covered with a reticulum of fibrin in the meshes of which are included many red blood cells and numerous leucocytes and new capillaries indicating attempt at organisation (fig. 10). In the texture the most important changes seen are in connection with (1) Cellular infiltration and fibrous tissue formation (2) the blood vessels and (3) the coils of mucous glands.

The most characteristic change seen in the texture is the extensive infiltration with various types of cells. Some of these cells are of the round cell type, others of the endothelial type and only a few are of the poly-morphonuclear type. Many of these cells are found collected together round ova of the parasite in the form of what Fairley has termed Bilharzial pseudotubercles (the so-called follicles of Krishnamurti) forming many giant-cells systems like those that are usually formed around foreign bodies (fig. 11). In some places, this appears to have been followed by infiltration by eosinophile and fibroblast and later by encapsulation. The great majority of the infiltrating cells seen in the granulation tissue are of the Eosinophile type. These cells are so numerous and the sections so literally studded with them that it would appear that they constitute the chief cytological response to the bilharzial toxin. These cells are quite noticeable in Hæmatoxylin and Eosin preparations but they are shown to greater advantage when Leishman's stain is used. This excessive amount of eosinophilia is revealed not only by examination of the sections but also by examination of the blood and the nasal discharge. This eosinophilic infiltration is diffuse in some parts of the section. In others, especially in the neighbourhood of the eggs, the eosinophiles are aggregated into round somewhat well circumscribed masses having the appearance of tubercles disposed round a cavity. In many cases this cavity is hollow and some of these hollow cavities have striking resemblance to the shape of the egg of the parasite. In other cases these spaces are seen to be occupied by eggs enclosing well defined embroys in their interior (fig. 12) and in still other places one finds a fully developed miracidium in this cavity. In some places a cavity is entirely absent and then the aggregated masses of eosinophile cells have the appearance of abscesses like the eosinophilic abscesses seen in Trichinosis (fig. 13) These lesions are

chiefly confined to submucosa showing that the eggs are generally deposited in this layer and that the distribution of microscopic lesions corresponds with the blood supply. From the descriptions given by Krishnamurti (18) and Cooper (7, 8) of the histology of these growths it would appear that both these authors have looked upon these agglomerated masses of eosinophiles as the "ray" or "club" formations of an actinomyces-like fungus.

In some parts of the section one notices necrotic foci and suppurating centres corresponding to those seen during naked eye examination of the growths. One also finds scattered all over the section empty spaces of various shapes, many of which bear a close resemblance to that of the spindle shaped eggs seen in the nasal discharge (fig. 14). There is no doubt that these spaces represent the places formerly occupied by the eggs which have been removed as a result of tissue reaction against them.

The next most important changes are those seen in connection with the blood vessels. There is active proliferation of the vascular endothelium with the formation of a large number of capillary loops. These capillaries are specially numerous in ulcerated areas. It is the presence of these numerous capillaries which explains the excessive hæmorrhage which frequently follows surgical removal of the growths. The larger blood vessels in the depth of the section specially the veins, show in their interior, transverse sections of schistosomes, some of them single, others in coupla (fig. 15). Such veins also show considerable dilatation and endophlebitis. In some cases the vessel wall is quite in tact ; in others it has been ruptured and hæmorrahage has occurred into the extravascular tissue (fig. 16.). In the majority of cases the parasites in the vessel wall show no sign of degeneration so that the endophlebitis seen must be attributed to the toxin liberated by the parasite. Around some of the veins containing the parasites there can be seen the same kind of cellular infiltration with formation of large plasmoidal Giant cells, eosinophile infiltration and fibrosis as seen around the eggs, giving rise to similar pseudotubercles, finally leading to obliteration of the vessel. It must be stated here that although eggs and the eosinophile tubercles are always found, sections of the adult parasites are not met with in every growth. They are most likely to be found only when large growths taken from an animal showing acute symptoms are studied. Such large growths are usually found higher up in the nasal fossæ. This is probably the reason why previous workers failed to observe them during their studies.

Other vessels, specially the arteries, show varying degrees of endarteritis up to the stage of obliteration of the lumen in some cases. (Fig. 17.).

In the submucosa are a large number of coils of mucous glands In some of these one can find signs of degeneration varying from cloudy swelling, fatty degeneration to necrosis. There are others which show signs of excessive secretion.

On carefully teasing a growth that showed sections of the parasites on histological examination, the author was successful in isolating damaged males and females in copula. (Fig, 18).

Postmortem Examination.

It has been already mentioned that Nasal Granuloma is seldom fatal. Besides destruction of cattle for experimental observations meets with such a religious resentment in this country that one cannot resort to it freely. It is probably for this reason that no previous investigator has recorded any postmortem findings. At this laboratory however one affected animal was destroyed with chloroform by Mr. R. T. Davis, I.V.S., Principal, Bihar and Orissa Veterinary College. This animal, a bullock over 12 years old, had been suffering from the disease for over two years. At the time of destruction he was showing acute symptoms of the disease but his condition was otherwise fair and his external appearance did not show anything unusual.

Examination of the abdominal cavity revealed congestion of the portal system as well as enlargement and distention of the mesenteric vessels. The liver was slightly congested, showed a few gray nodules on its surface and in certain places showed mild cirrhotic changes. The kidneys showed slight congestion. The bladder contained about 2 ounces of clear urine; its mucous membrane showed only a few petechial marks. The spleen and the stomach showed nothing unusual. In the intestinal tract the duodenum showed some small pea to large pea sized nodules and for about 3 ft. showed great congestion. The ileum and the jejunam were deeply congested throughout. The cæcum showed petechial marks and ecchymotic patches in other parts. The rectal mucosa showed nothing unusual. Similarly the mouth, pharynx and the oesophagus did not show any morbid changes.

In the respiratory tract, the nasal fossæ showed the most characteristic changes. The vomer, the septum nasi and the turbinated bones were intensely congested. Granulomatous growths of various sizes were present on all the turbinated bones, latteral alae and the septum nasi extending from the anterior nares up to about the olfactory region of the nasal fossæ. (Fig. 19). From the distribution of the lesions it would appear that the Schistosomes must have reached the nasal fossæ by way of the spheno-palatine vessels.

The larynx showed on both sides small pin head sized elevations. The trachea showed nothing unusual. The right cardiac lobes of the lungs were adherent to the parietal pleura by means of a fibrous band and the right diaphragmatic lobe contained a tennis ball sized hydatid cyst. Nothing unusual was found in the pericardium or the heart.

Collection of Schistosomes:—These parasites were mostly obtained from the mesenteric blood, portal vein and the liver. In the case of the mesenteric blood, all the blood that fell into the peritoneal cavity after removal of the intestines and cutting of the main branches of the portal system was collected in beakers. Samples of this collected blood were then poured into a white enammelled tray, some water added and careful search made for the parasites. Many of the worms were in copula. The males were found as small white bodies coiled up in the form of a letter "C" and were undergoing various changes in shape. The females only found in copula were found to be hair-like structures about twice the length of the male and much darker in colour.

The majority of the parasites were obtained from the liver. The organ was removed from the body. The portal vessel still attached to it was then opend and its blood collected in the dish. Pressure was then applied to the liver to get more blood. The organ was then freely incised, then cut up into small portions which were then placed in a bucket and as much of the fluid as possible was then expressed out of them. The blood thus collected was then examined for parasites in an enammelled tray. The majority of the worms were in copula ; only a few were single males ; no single female was found.

Detection of the ova :—Examination of the scrapings from the rectum, other parts of the intestine, and bladder did not show any eggs. As most of the time was taken up in search for the parasites in the liver and the mesenteric blood, continued examination of the scrapings of the rectum and intestinal tract could not be made. In view of the finding of two other types of the Schistosomes the author believes that a more detailed search of the intestinal tract would have revealed the presence of the types of eggs, which as already stated were seen in pieces of mucosa snipped off per rectum.

Microscopic examination of the eggs in the females of the worms found in copula showed that there were at least three species. One of them contained the eggs exactly like those seen in the nasal discharge ; these worms were only found in the liver.

Another contained an egg which resembled the egg of the *Schistosoma bovis*. And the third contained an egg which does not appear to have been described so far. The author proposes to record

these findings in a separate communication and describe the hitherto undescribed egg of what appears to be a new species of Schistosome.

From the few specimens of adult parasites, the females of which were all in copula and showed eggs which were indistinguishable from those seen in the nasal discharge it was not possible to get complete morphological details. Descriptions of the adults are therefore held in abeyance, pending the study of a large number of Schistosomes, which the author hopes to get in the near future, from the rearing experiments that are being carried out at this laboratory.

The morphology of the eggs in utero, however, was quite clear and constant. As found in the uterus they were numerous and occurred in rows of one and two. When two eggs were found together they were usually found to be lying with their concave borders facing each other. These eggs in the uterus were identical in shape with both the immature and mature ones found in the nasal discharge. Their contents however filled the shell and were dark and granular. On an average they measured 232 microns long; 49·8 microns at the widest part of the bulging; 9·9 microns across the spinal extremity and 13·0 microns across the other prolongation. The spine measured 9·9 microns long. A few ova were found in the extrauterine situations, apparently having been extruded by the female in the gynecophoral canal. Their average dimensions were as follows :—

Length 273·8 microns; width 49·8 microns; length of spine 9·9 microns.

Remarks as to specificity.

The morphological details of the adults have not been obtained. This however need not affect our tentative conclusions of the identity of the Schistosomes because as pointed out by Sambon, the Schistosomes of man and cattle are very much alike in general appearance and structure and the most characteristic and striking difference is that of their eggs which differ markedly in each species.

The only species of Schistosomes known to possess ova corresponding to those found in the nasal discharge are the *Schistosama spindalis* of cattle, first discovered by Montgomery (24) from India and later reported by Vryberg (29) from Sumatra, and the unfigured spindle shaped egg described by Christophers and Stephens (3) in the urine of a Madras native. The dimensions which Christophers and Stephens give for their eggs (205 microns by 53 microns) differ so whidely from those of the egg found in the nasal discharge that any connection between the two is improbable.

Likewise there appear to be some important points of difference between the *Schistosoma spindalis* and the Schistosoma of Nasal Granuloma. The egg of *Schistosoma spindalis* as described and figured by Montgomery (24) has the form of a triangle in which the base is almost straight and there is a notch at the apex, which is otherwise rounded. In the egg seen in the nasal discharge however the base of the triangle is in the majority of cases definitely concave, there is no notch at the apex, and the latter is also more rounded. Further Montgomery describes the spines of *Schistosoma spindalis* as straight pointed with no tendency to the hook like character and measuring 14—15 microns in mature ova. The length of the spine of Nasal Granuloma eggs varies from 3·3 microns to 9·9 microns but never exceeds 10 microns, in the majority of cases. In only one specimen it was 13·2μ. The spine is also not quite straight pointed. In some it is distinctly bent and tends towards the blunt. There is also some difference in dimensions of these eggs. The maximum dimensions in the eggs of *Schistosoma spindalis* Montgomery, are length 400 microns, breadth 44 microns. Those of the eggs of the parasite of Nasal Granuloma are:—length 581 microns; breadth 83 microns. It has been mentioned that examination of the fæces and even the rectal scrapings fail to show eggs similar to those seen in the nasal discharge. The work of Montgomery (24), Liston and Soparker (22), and Vryberg (29) has however shown that *Schistosoma spindalis* mostly affects the alimentary canal and its ova are usually found in the fæces and no nasal lesions in animals affected by it have been recorded by these authors.

There are therefore sufficient anatomical differences of the egg which together with differences in predilection seats and the clinical features of the disease would justify the tentative conclusion that the Schistosome responsible for Nasal Granuloma is somewhat distinct from *Schistosoma spindalis* Montgomery, 1906. It is well known that the ova of *Schistosoma haematobium* are always discharged through the bladder while those of *Shcistosoma mansoni* through the rectum and the only difference between them is the presence of a lateral spine in the case of *S. mansoni* and a terminal one in the case *S. haematobium*. Further work now being carried out at this the laboratory will show whether this tentative conclusion is correct or not. Should the specificity of the parasite be admitted the name *Schistosoma spindalis var nasale*, as indicating the special location of the parasite, would appear to the author, as the most suitable one.

Discussion.

The results of these investigations show clearly that the definite cause of Nasal Granuloma in cattle is a species of Schistosome, and

it can be shown that all the features of the disease are in perfect consonance with this theory. The strictly regional and seasonal distribution of this disease is due to the fact that such localities and seasons provide just the conditions for the Intermidiate hosts the snails, and the high enzootic index of the disease will be seen to coincide with the concentration of the particular snail which acts as the intermediate host of the parasite. In Egypt endemic hæmaturia is likewise restricted to the neighbourhood of the Nile and irrigated areas and this appears to be the case with all forms of Schistosomiasis. It is now easy to understand why it has so far been found impossible to convey infection by ingestion and inoculation experiments. It becomes clear how water and grass infected with cercariæ can convey infection to healthy animals. It is likewise easy to explain why Nasal Granuloma occurs only in India and not in other countries as the particular Schistosome appears to exist in India only. This has a parallel in *Sehistosoma haematobium* which is very common in Egypt but is notably absent from India. The chronic nature of the disease is also in keeping with what obtains in other cases of Schistosomiasis, some of the cases in human beings lasting for ten years or more. It can now be explained why treatment of Nasal Granuloma with potassium iodide has failed while treatment with tartar emetic has been so successful. This drug has been found by Christopherson (4, 5, 6) and many workers all over the world to be very nearly a specific in human bilharziasis and similar good results have been recorded in animal bilharziasis by Low and Newham as stated by Hutyra and Marek (16),

Histogenesis :—One can now understand the genesis of the peculiar lesions in the nostrils. As in other schistosomes the cercariæ which are the infective forms of the parasites enter the skin or mucous membranes and travel by veins or lymphatics to the right side of the heart from where they make their way to the liver, where they attain maturity. When mature, the worms, mostly in copula, leave the liver and travelling by the venous trunks reach the submucosa of the nose. Having established themselves in the veins of the nasal submucosa the fertilised females start to discharge their eggs (usually intravenously) which then work their way through the tissuess to the exterior by means of their spines. Partly as a result of this repeated mechanical injury but mostly as shown by the work of Leiper (21) and Fairley (13, 14) by the cytolytic toxins of the larva exuded through the eggs as well as that of the adults, there begins a subacute or chronic inflammatory reaction consisting of, in early stages, an infiltration with round mononuclear, endotheliod and polymorphonuclear cells, so that the histology of the earliest lesion is somewhat similar to that of a tubercle in which the cellular elements

surround the irritating ova or parasites. This infiltration is for the purpose of removing the irritant by the lytic process, and the death of the ova and adults in situ sometimes seen in sections is due partly to this local reaction and partly to the general systemic response. When this attempt at removal has failed the reaction of the surrounding tissues sets free the fibroblast and the eosinophiles to delimit the activity of the irritant by forming a capsule round it. The extent of the eosinophilic infiltration would appear to indicate that this cell constitutes the main response to the bilharzia toxin. The granulation masses produced as the result of this reaction cerrespond with the lesions produced by *Schistosoma haematobiam* in the bladder and those produced in the rectum by *Schistosoma mansoni.*

These findings not only provide us with an easy method of diagnosing Nasal Granuloma with certainty but also afford us a ready means of checking the beneficial effects of the treatment with tartar emetic for, as shown by Christopherson, (4, 5, 6) apart from Fairley's complement fixation test, the microscope is the only sure means of estimating the total amount of drug necessary to be given in a particular case. The injections are to be pushed to a stage when no more eggs or only dead dark and shrivelled ones are visible in the discharge. This fact must always be borne in mind because even after the subsidence of the clinical symptoms the animal may still be a bilharzia carrier by discharging eggs which are able to hatch.

It might be mentioned in passing that as stated by Bayliss (1), Porter in South Africa has observed the occurrence in human beings who have been closely associated with cattle or goats, a species of Schistosome which he has termed *Schistosoma spindalis* var africana. A search for a similar parasite in human beings in affected areas might yield interesting results. It is quite possible that the unfigured egg discribed by Christopher and Stephens (3) in the urine of a Madras native might be a variety of the spindalis type met with in animals.

The present discovery also enables us to suggest definite prophylactic measures. Inspection of the fodder and pastures should be carefully done and if possible animals should not be allowed to graze during the periods when Nasal Granuloma is common. Attention should also be directed to the quality of the drinking water, tanks, pools and ditches being avoided. There are however obvious difficulties in observing all these precautions. Considering the small size of cercariæ and their abundence during season it is highly improbable that the animals will escape infection. Fortunately in tartar emetic we have not only a curative but also a valuable prophylactic agent, for this drug not only kills the adult parasites but also destroys their eggs and thus prevents their further multiplication. There is

therefore no reason why systematic application of this medicine should not succeed in eradicating this disease from any affected area.

CONCLUSIONS.

(1) Nasal Granuloma is a form of Schistosomiasis in which the lesions are confined to the nasal mucosa which is selected by the parasites for discharging their eggs to the exterior.

(2) The species of Schistosome responsible for the condition resembles somewhat the *Schistosoma spindalis* Montgomery, 1906, but shows some distinctive features which would justify the tentative conclusion that it is a distinct species.

(3) Nasal Granuloma does occur in Buffaloes although rarely and the species of schistosomes responsible for the condition appears to be identical with the one responsible for the disease in cattle.

(4) Tartar emetic is not only a curative but a valuable prophylactic in this disease. Its systematic application would result in complete eradication of the disease.

(5) Microscopic examination of the nasal discharge is the best means of diagnosing the disease and estimating the total amount of the specific drug required in a particular case.

ACKNOWLEDGMENT.

I take this opportunity of expressing my gratitude to Prof. R. T. Leiper of the London School of Tropical Medicine Hygiene for helpful advice given during personal conversation in London. To Mr. R. T. Davis, Principal, Bihar and Orissa Veterinary College. I am indebted for the facilities he had given me during this investigation and for taking the trouble of destroying one bullock for postmortem examination. Thanks are also due to Prof. G. N. Roy Choudhuri who has given all possible help for observations to be carried out on out-patients coming to the hospital. The Veterinary surgeons all over the province have also shown creditable promptness in their response to my questionnaire. I also wish to place on record my appreciation of the patient and enthusiatic manner in which my laboratory assistants and demonstrator have worked thoughout this investigation.

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CERCARIA KYLASAMI, SP., NOV.*

By

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This cercaria was obtained only from *Planorbis exustus* (Deshayes) during the early part of this year. Out of over 500 snails collected from the Spur Tank, Egmore, only 22 discharged these cercariae. Round about Spur Tank a fairly large number of *dhobis'* donkeys and other cattle are seen grazing and they all drink water out of this tank. So far, it has been found that that tank contains mollusca fairly heavily infected with many kinds of cercariae.

Description of the Larva.

It is a fairly large cercaria, light brown in colour, extremely active and swims vigorously in water with its tail uppermost. The movement is characteristic and is common to all amphistome cercaria. The cercaria while swimming suddenly stops all movement and elongates its body or sometimes curls it ventrally, or contracts it to such an extent as to make it appear reniform and swims again. When viewed under the microscope between a slide and cover-slip, with moderate pressure, its body is lanceolate in shape, with the tail attached to the wide end. The attachment of the tail is slightly dorsal. The body being flexible and extensile, the measurements may not be reliable ; hence a camera lucida drawing of one specimen is appended with scale for making the necessary measurements if one so desires (Plate XXII, fig. 1.)

The cuticle of the cercaria is thin but fairly rough. Under it, there is a large number of cystogenous cells containing rod-like granules and also pigment granules. There are two conical eyes, each having a beautiful convex lens at the base of the cone and directed upwards and outwards.

The oral sucker is at the anterior end of the body and is well developed. It has round it a rim of cuticle with a sinuous margin. The pharynx seems to be fused with the oral sucker making it appear elongated. There are two lateral diverticulae at the commencement of the oesophagus, which begin in an infundibuliform opening at the posterior end of the oral sucker. The oesophagus bifurcates, into two intestinal cecae, some distance behind the level of the eyes. Just before its bifurcation, the oesophagus becomes muscular with muscle fibres running longitudinally. Two intestinal glands one from each

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Plate XXII.

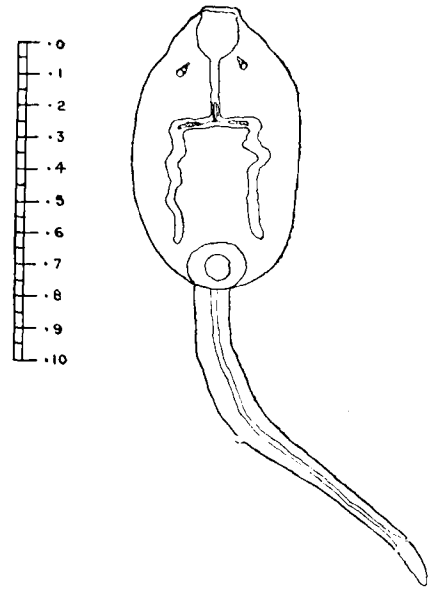

Fig. 1.

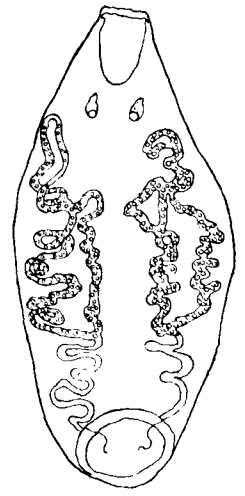

Fig. 2.
C. *kylasami* shownig excretory system.

Fig. 3.
Redia. C. *kylasami.*

Courtesy : "The Imperial Council of Agricultural Research."

cecum, open their ducts into a common atrium in the centre of this muscular portion. Each gland floats free in the lumen of the intestinal cecum and is held, apparently, by the end of its duct attached to the muscular portion of the oesophagus. Perhaps, these glands have a digestive function. The two intestinal cecae almost reach the posterior sucker after a fairly wavy course, the ends being bluntly rounded and not coiled up spirally as in *Cercaria indicae* No. XXI Sewell (1922).

The excretory system is composed of a bladder situated in front of the posterior sucker, the excretory tubules opening into it. There is one set of tubules on each lateral half of the parasite. Each main tube can be traced from the excretory bladder going forwards with a tortuous course and replete with excretory granules. It turns backwards just behind the eye and with a more tortuous course it gets broken up into smaller tubules as it turns again forwards near the posterior sucker. The excretory granules are present in the retrograde tubule also and they disappear, however, in the tubules in the posterior third of the parasite. The finer tubules and flame cells could not be traced out owing to opacity of the body of the larva. This opacity is due to the presence of brownish pigment and cystogenous cells, under the cuticle. The interesting and important feature is that there is no cross-connection between the main tubules of each side. The excretory pore of the bladder opens dorsally. The tail is fairly wide at its junction with the body of the larva and tapers towards its free extremity which is blunt and rounded slightly. It is muscular and contains a few granules, thrown in between the muscle fibres. There is a caudal canal which runs from the bladder, to almost the end of the tail where it dilates into a pear-shaped cavity, from which two small canals open to the exterior.

The genital system is seen in the shape of two masses of cells, placed one behind the other, about the median line in front of the excretory bladder. These are perhaps the future testes. Another mass of cells is seen a little to the side of the bladder and this is perhaps the future ovary.

These cercariae develop in rediae. Each redia has a mouth which leads into a short gut full of ingested dark material. A few glands are present round about the gut and these open in the mouth. There is a birth pore some distance behind the oral opening. There are two pairs of locomotor appendages. Each redia contains about three or four almost mature cercariae wanting in pigment granules and five or six immature cercariae. In young rediae three pairs of flame cells are seen. The anterior pair is a little behind the level of the termination of the gut and the next two pairs are at the level

of the anterior and posterior pairs of locomotor appendages respectively (Plate). XXII.

Discussion.

Sewell (1922) divides the amphistome cercariae into two groups, (1) the Pigmentata group and (2) the Diplocotylea group. He was able to discover only one example, *Cercariae Indicae* XXI, which he included provisionally under the Diplocotylea group created by him. The characters of this group are described by him very well and the salient points are as under :—

1. Presence of pharyngeal pouches.
2. Absence of cross-connections between the main excretory canals found on each side of the body.
3. Presence of two pairs of locomotor appendages in the redia.
4. The cercariae leave the redia while still immature and complete their development in the tissue of the mollusc host.

The cercaria described above presents all these points; therefore this has been placed under the Diplocotylea group. It differs from *Cercariae indicae* XXI Sewell, in showing what look like oral diverticulae, in having excretory granules in the main tube and also in its retrograde continuation, and in having bluntly rounded extremities of the intestinal cecae, It is, therefore, considered that this cercaria is different from the one described by Sewell and I propose to name it "*Cercaria kylasami.*"

My thanks are due to Mr. S. Vaidynatha Mudaliar, Assistant Lecturer, for the help rendered by him.

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CERCARIA SAUNDERSI, N. SP.*

By

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The study of larval trematodes found in the fresh water molluscs of India has not received much attention apparently. Sewell (1922) published his valuable work on *Cercariae indicae* wherein he has described about fifteen furcocercous cercariae and has classified them. Soparkar (1921), who restricted himself only to furcocercariae, has described only about five of such found in Bombay. All those include the Pharyngeal and Apharyngeal furcocercus cercariae. The present paper deals with an apharyngeal one.

The behaviour of this larva in a tube of water is peculiar. It adheres to the sides of the tubes quite firmly with its powerful ventral sucker, occasionally swims, tail foremost, and often in spasmodic jerks. The larvae do not go down to the bottom of the tube, but, remain resting in the vicinity of the snail from which they came. This shows that they are not powerful swimmers. They are positively phototrophic.

Each larva has two black vestigial eyes with transparent convex lenses directed upwards and outwards. The whole length of a living cercaria varies from 0.8 mm. to 1.0 mm. In a fixed larva the body measures 300 μ × 75 μ, the tail stem 400 μ × 35 μ and each furcal ramus 225 μ. The body and the tail are covered over with fine spines, more on the body than on the tail. The ventral sucker is also armed with spines. The snout or anterior organ is about 90 μ in length and the posterior portion is muscular. There is a single head gland. The mouth is terminal or slightly sub-terminal and is connected with a delicate tube which runs down the snout and is followed by a fine tube in the anterior portion of the body without apparent dilation or bifurcation. This consists a simple alimentary canal.

There appears to be six hollow spines situated terminally on the snout, three on each side and into these the three pairs of mucin glands open by means of stout ducts. Among these mucin glands, the two anterior ones which surround the ventral sucker have coarse granules and the two posterior pairs, which almost fill the posterior region of the body have fine granules in them. There are two masses of nervous system laterally between the eyes and the snout, and a few granules, in a mass, behind the ventral sucker which represent the future genital system.

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The excretory system is made up of the anterior lateral ducts, or collecting tubes, which unite to form two main tubes which open into a small rounded excretory vesicle at the hind end of the body. There are two patches of cilia in each main excretory tube behind the union of the anterior and the posterior collecting tubes. On each side of the body there are seven flame cells including the one in the tail. In each half of the body they are distributed as follows :—

In the anterior portion there is one flame cell postero-lateral to the snout, one behind the eye, and another antero-lateral to the ventral sucker. In the posterior portion there is one flame cell postero-lateral to the ventral sucker, one lateral to the "eyelet" aperture and another midway between these two. The "eyelet" aperture is the opening into the excretory canal of the tail stem. A little behind this opening are the flame cells of the tail stem.

The ventral sucker is an interesting organ. It is muscular, protrusible and has six bands of muscle which run from it and are attached dorsally and laterally to the body wall. The sucker protrudes so much that one often gets the larva on its side when examining it between a slide and coverslip.

The tail stem is longer than the body with a fairly wide canal running through its length. The furcal rami have narrow and delicate finfolds running nearly two-thirds of their length from the free end. There is a constriction at the junction of the rami with the tail stem. The canal in the furcus ramus opens to the outside at its tip in a barrel-like extremity.

The parthanitae are sporocysts which are long, lightly yellow in colour and contain plenty of dark granules. No birth pore could be observed nor the excretory system. The sporocysts showed movement resembling peristalsis.

These cercariae were obtained from *Limnea accuminata* (Lamarck) found in the Spur Tank, Egmore. About 4 per cent. of them were found infected and in four instances these were associated with *Echinostome cercariae* in the same snail.

The characters of the cercaria described can be summed up as follows:—

1. The anterior organ is muscular posteriorly.
2. Alimentary canal is more or less a capillary tube.
3. Pigmented eyes with lenses.
4. Ventral sucker powerful, with muscular bands extending to the dorsal and lateral body wall.

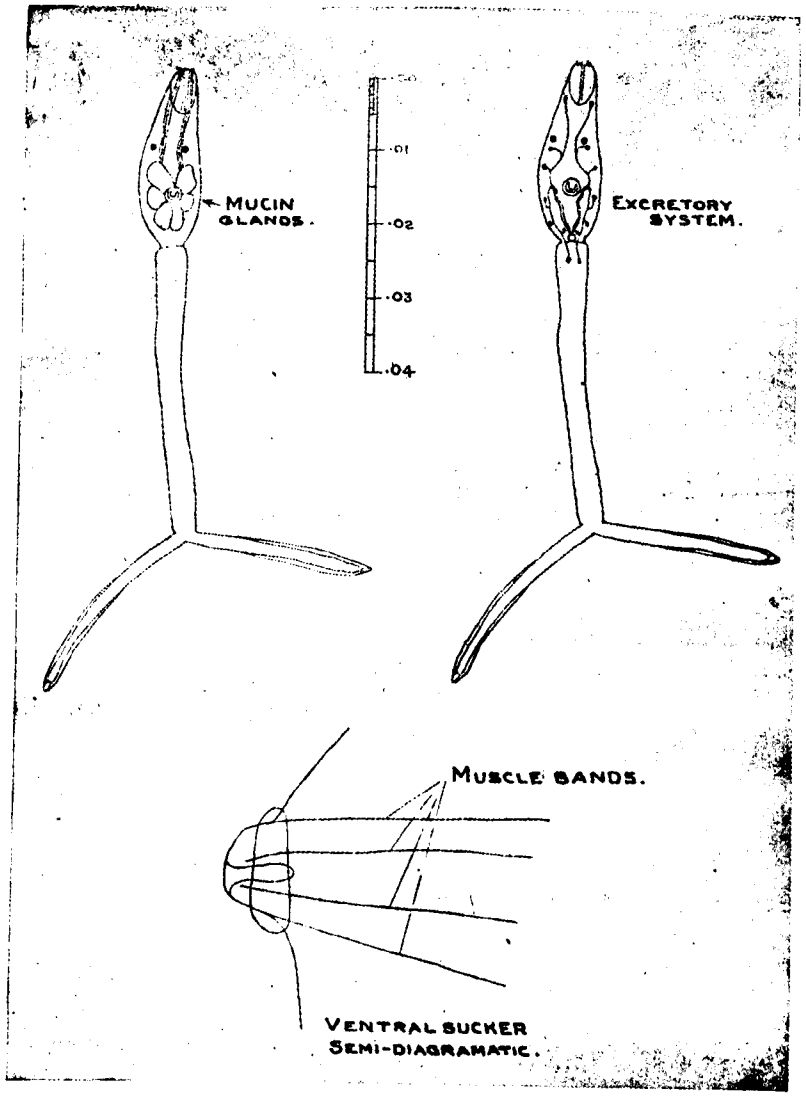

Fig. 1. *Cercaria saundersi :* showing a few anatomical details.

Fig. 2.
Photo micrograph of the cercaria.

Courtesy : "The Imperial Council of Agricultural Research."

5. Mucin glands large with stout ducts connected with penetrating spines on top of the anterior organ.
6. The furcal length is more than one half that of tail stem.
7. The furcae have narrow finfolds.
8. Development in long sporocysts.

The characters summed up above seem to be common to those cercariae of the "Elvae group" described by Miller (1927). Therefore this cercaria is placed in that group.

It resembles *C. macrosoma* Brown (1926) in having a spinose body and in having muscular bands between the ventral sucker and the walls of the body. The flame cell formula is similar. It differs from it in having three pairs of mucin glands and in having the opening in the tips of the furcal rami.

It resembles *C. milleri* Fast (1926) in many respects, but differs from it in the flame cell formula and in the number of mucin glands. Further *C. milleri* is aspinose.

It resembles *C. tuckerensis* Miller (1924) in having a capillary alimentary canal, but has no intestinal ceca. The number of mucin glands and flame cells is different in *C. tuckerensis*.

It is interesting to note that only one cercaria, *C. bombayensis No. 19*, Soparkar (1921), found in India has been included in that group. The cercaria in question differs from this in the flame cell formula, and in possessing finfolds on the furcal rami.

The cercaria described seems to be a new species, and it is proposed to name it "*cercaria saundersi*".

Attempts were made to infect a white rat, a fowl and a frog (*Rana tigrin*) with these cercariae with a view to obtain adults, but the same results were unsuccessful.

SUMMARY.

1. *Cercaria saundersi*, n. sp., is an apharyngeal longifurcate cercaria having finfolds on its furcal rami.

2. In its body there are three pairs of mucin glands round a protrusible ventral sucker supported by bands of muscle which run from it to the dorso-ventral walls,

3. The anterior organ is muscular posteriorly and the alimentary canal is only a capillary tube.

4. The excretory system has 6 pairs of flame cells in all. There are two patches of cilia in each main excretory tube.

5. This cercaria is placed in the "Elva group" described by Miller (1927).

6. The cercariae are obtained from *Limena acuminata* Lamarck.

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Anatomical Section.

SOME PECULIAR ANATOMICAL FINDINGS IN THE HORSE.

By

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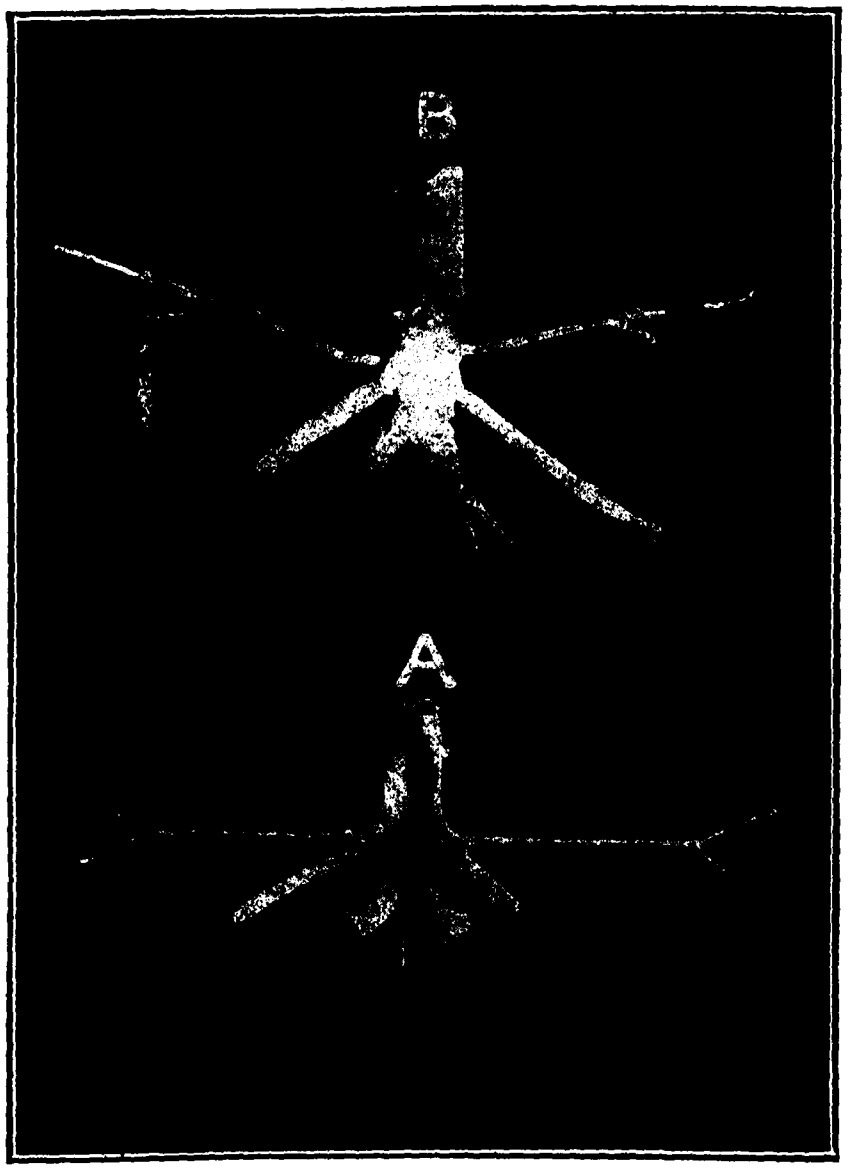
(Continued from page 198, No. 111, Vol. IX.)

11. *Variation in the origin of the circumflex iliac artery* :—The circumflex iliac artery is usually detached from the outer side of the external iliac artery close to its origin from the posterior aorta, Sisson has observed that this circumflex iliac artery may arise either from the external iliac artery close to its origin or from the aorta directly. I have in the course of my dissections in the horse, invariably found this branch coming off from the external iliac artery. But in the subjects dissected on 9-11-29 and 22-10-30, circumflex iliac of the left side instead of being a branch of the external iliac of that side was found to be coming off from the aorta itself about an inch in front of the quadrification. But the circumflex iliac of the right side originated from the external face of the external iliac of that side (Plate XI as seen in the subject on its back).

In cat and dog, the circumflex iliacs are usually seen arising from the terminal part of the aorta.

Though Sisson observes that these circumflex iliac arteries in the horse, in some cases, may arise from the aorta directly, he does not

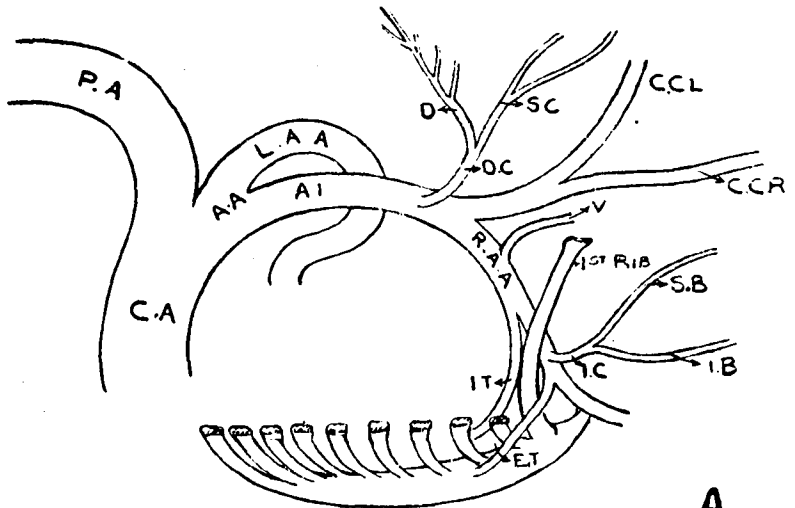
Plate No. XI.



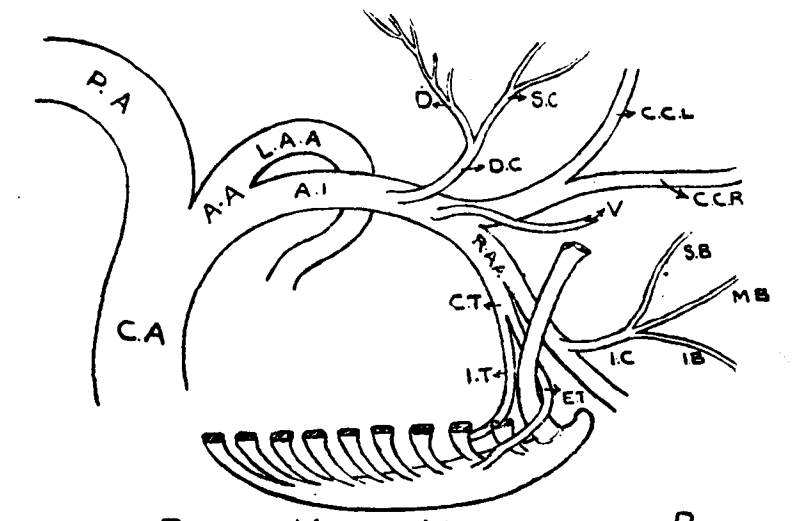
Variation in the origin of the circumflex iliac artery.

A : Normal

B : Variation in the origin of the circumflex iliac artery of one side.



RIGHT VIEW - NORMAL — A



RIGHT VIEW- VARIATION — B

Variation in the origin of some of the Intro-thoracic branches of the Axillary Artery.

C. A: common aorta; P. A: posterior aorta; A. A; anterior aorta: L. A. A: left axillary artery: A. I: arteria innominata; D. C. dorso-cervical artery; D: dorsal artery; S. C: superior cervical artery; C. C. L: common carotid-left; C. C. R: common carotid-right; R. A. A: right axillary artery; V: Vertebral artery; I. C: inferior cervical artery; S. B: superior branch; I. B: inferior branch; M. B: middle branch; I. T: internal thoracic; E. T: external thoracic artery.

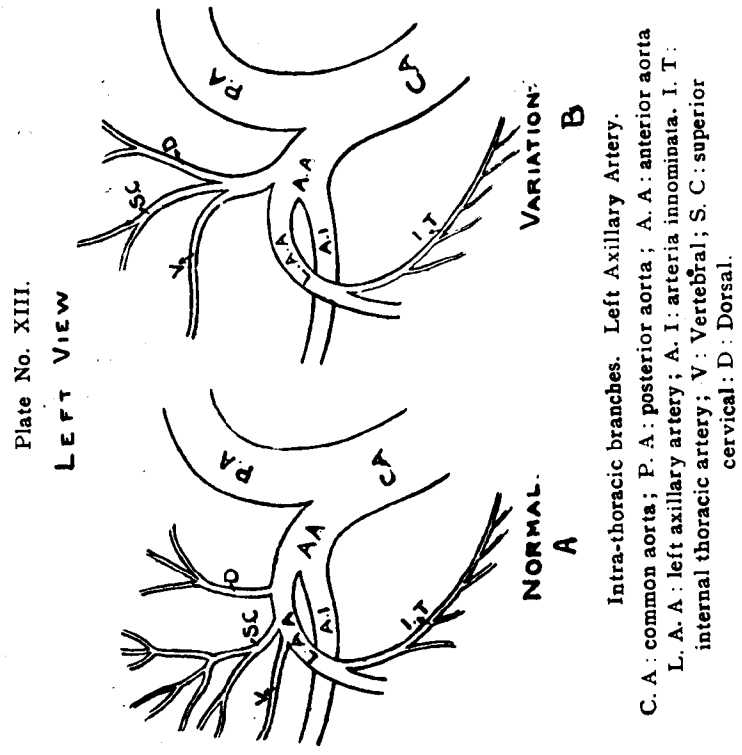


Plate No. XIII.

LEFT VIEW

Intra-thoracic branches. Left Axillary Artery.

C. A : common aorta ; P. A : posterior aorta ; A. A : anterior aorta

L. A. A : left axillary artery ; A. I : arteria innominata. I. T : internal thoracic artery ; V : Vertebral ; S. C : superior cervical : D : Dorsal.

add that one of them may arise from the aorta and the other from the external iliac artery in the same subject and hence this note.

12. *Variation in the origin of some of the intra-thoracic branches of the Axillary artery*:—What is usually described in books and what is generally met with in the course of dissection of the right axillary artery is that it gives off a branch—the *internal thoracic artery* from its posterior face at its inferior part and that just at its point of winding round the anterior border of the first rib, it detaches: (1) the *inferior cervical artery* (from its anterior face) and (2) the external thoracic artery (at the same level but from its posterior face). (Plate XII-A. In a bony-mare I dissected on 10-10-29, I found the following :—

(*a*) One of the intra-thoracic branches—the *vertebral* artery was found coming off from the superior face of the arteria innominata (brachio-cephalic) a little in front of the dorso-cervical artery and about half an inch behind the bifurcation of the arteria innominata. It is thus seen that the vertebral artery was a branch of the arteria innominata instead of being as usual a branch of the right axillary artery. The dorso-cervical artery itself which is usually either at or a little behind the arteria innominata was found detached from the arteria innominata further back or in other words its origin was found about an inch behind the bifurcation (Plate XII-B).

(*b*) The intra-thoracic branch of the right axillary—*the (right) internal thoracic artery*, instead of being a direct branch of the right axillary, was found as a large branch coming off a trunk which originated from the posterior face of the right axillary artery just as the parent (right axillary) vessel was winding the anterior border of the first rib. (The other branch of this trunk was found to be the external thoracic artery) (Plate XII-B).

(*c*) *The external thoracic artery* instead of appearing as a clear extra thoracic branch, was found to be coming off from the trunk from which originated the internal thoracic artery. In other words the right internal and external thoracic arteries, both originated from a common trunk which was detached from the right axillary artery. (Plate XII-B).

(*d*) *The inferior cervical artery* usually takes its origin from the anterio face of the right axillary just as this winds round the anterior border of the first rib and after a short course divides into superior and inferior branches. The superior runs up in a groove formed between mastoido-humeralis and subscapulo-hyoideus (brachio-cephalicus and omo-hyoideus) supplying these muscles and the pre-scapular lymphatic gland ; while the inferior runs down in a groove

formed between the mastoido-humeralis and the anterior superficial pectoral supplying these muscles. (Plate XII-A.)

But in this particular subject dissected on 10-10-29, I found a third branch (Middle branch)—(Plate XII-B) of about the same size as the other two and this third branch when traced was found entering the anterio deep pectoral about the level of the shoulder joint and terminating in it.

13. *Three of ihe intra-thoracic branches of the left axillary artery wanting*:—In a pony-mare dissected on 23-1-30, three of the intra-thoracic branches of the left axillary *viz*; vertebral, superior or deep cervical and dorsal branches were wanting. There was found a short branch springing from the upper face of the anterior aorta about half an inch behind its bifurcation. This branch divided in its turn into three distinct branches which took the place of the vertebral, superior or deep cervical and dorsal arteries. (Plate XIII-B-vessels as seen in the natural position). The internal thoracic artery of this auxillary artery in this subject was normal.

General Articles.

THE ORGANISMS OF THE GENUS PASTEURELLA AND THE CONTROL OF THE EPIZOOTICS CAUSED BY THEM.

By

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The very small ovoid rods of the genus Pasteurella, Trevisan 1887, among the gram negative nonsporulating bacteria play a paramount role in the causation of several epizootics of animals. The name Hæmorrhagic Septicæmia first suggested by Hueppe, with which the malady is familiar to us in India is not appropriate, as it represents a purely clinical and anatomical picture of the disease, that may also be seen in other diseases (Anthrax, Black-leg). It has therefore been rightly thought by Lignères to name these epizootics as Pasteurelloses after the organisms (Pasteurellas) causing them.

The definition of the genus Pasteurella, to which these organisms belong is somewhat inco-ordinate. While Bergey (1930) includes in this genus the organisms of human Plague and Tularemia along with those of the Hæmorrhagic Septicæmia (Pasteurelloses) of animals, I

should prefer in accordance with Hutyra and Schutz to consider the first named separately. For the sake of convenience, however, reference will be made here to the organisms of the Plague and Tularemia together with those of the Pseudotuberculosis of Rodents, all of which in virtue of their apparent similarity to the pasteurellas may be confused with the latter.

The Genus Pasteurella has the characters of the family Bacteriaceae, Cohn 1872 (gram negative rods without sporulation) and is considered under the tribe Pasteurelleae, Piribram 1929 (no alcalinisation on ordinary peptone media*). It differs from the other genus of the Pasteurelleae (Haemophilus) by its ability to grow on ordinary media and the typical bipolar staining in natural material. The type species of this genus is Pasteurella avicida (Kitt 1883) Trevisan (1887).

Many futile attempts to divide this genus into a number of species have been made. A differentiation of species based on morphological and cultural features, serological (Chamberland and Jouan, Matsuda, Miessner and Schern, Gräfe, Cornelius) and immunological reactions (Ligniéres) and pathogenicity (Hueppe, Kemeny, Scennikov, Haan, Bergey) have been inpracticable, such features only serving to establish the identity of the group. Pasteurellas are therefore regarded as a collection of strains fundamentally identical, though capable of adaptation in respect of one or the other animal host. Hence the so-called zoological classification, *i.e.*, a division according to the animal origin of each individual strain is the most obvious method, and the right way of expressing this systematically is to call them "formae speciales" according to the animal species from which they are isolated. Thus:

Pasteurella avicida	forma typica	*P. avicida*
,, ,,	forma specialis bovis	*P. boviseptica*
,, ,,	f. sq. bubali	*P. bubaliseptica*
,, ,,	f. sq. suis	*P. suiseptica*
,, ,,	f. sq. cuniculi	*P. cuniculicida*

and so on.

As no bacteriological characterisation serves to distinguish one of these special types from another, the description of the type species as the only representative of the genus will be given here.

Pasteurella Avicida.

These are short oval organisms 0·4 to 1·25μ in length occurring as single cells or in pairs; take bipolar staining which is more

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* (This definition of the tribe Pasteurelleae is given by Haupt in his unpublished lectures).

pronounced in bacteria derived directly from the body; non-sporulating, nonmotile, gram-negative, growth at 37° C. on all ordinary media under aerobic and anaerobic conditions without alcalinisation and inability to grow on media in presence of bile salts; Gelatine is not liquified, milk remains unaltered in reaction and is not coagulated; nitrates reduced to nitrites; indol and H_2S produced; acid in glucose, saccharose, laevulose, sorbitol, galactose, mannose and with exceptions in mannitol, xylose and trehalose; no acid in lactose, dulcitol, amygdalin, raffinose, rhamnose, adonitol, dextrin, inulin, glycerol, erythritol and with exceptions in arabinose, maltose and salicin. Gas is in no case produced,

Differential Diagnosis.

As already mentioned the Pasteurellas are to be differentiated from *Bact. pestis*, *Bact. pseudotuberculosis rodentium* and *Bact. tularense* which are more or less similar to the former.

Bact. pestis which bears a similarity to the Pasteurellas through its ability to take bipolar staining, inability to produce alkali in ordinary peptone media and its nonmotility is differentiated from the latter by its ability to ferment rhamnose and glycerol, inability either to ferment saccharose and sorbitol or to produce indol and H_2S. and by its growth in the presence of bile salts.

Bact. pseudotuberculosis rodentium produces neither indol nor H_2S, ferments rhamnose and glycerol but not saccharose and sorbitol and grows in the presence of bile salts. It is differentiated from *P. avicida* and *Bact. pestis* by its motility when cultivated under 30° C. and its production of alkali on ordinary peptone media.

Bact. tularense does not grow on ordinary media but has preference to media containing yellow of the egg.

Pathogenicity.

Pathogenic action of the members of the Pasteurella group is highly variable. Organisms of high virulence gaining access to the tissues of a susceptible animal can multiply with great rapidity and cause death in a few hours. The surprisingly sudden occurrence of death of cattle, especially of buffaloes, in their stalls or at work and the startling suddenness of the disease in a poultry where the birds are found dead without previously showing signs of disease, are due to pasteurella infection.

Pasteurellosis in its acute form is characterised by a generalised haemorrhagic inflammation accompanied by high fever; blood-stained exudates collect in the serous cavities and loose connective tissues, the latter giving rise to the condition of oedema which is well marked in cattle; punctiform haemorrhages under the serous

and mucous membranes are a constant accompaniment. More chronic forms of the disease result in more localised reactions thus giving rise to the different forms of the disease such as pectoral, cutaneous, intestinal forms, etc. The lungs are more frequently involved.

The Pasteurella organisms may act (1) independently, as sole etiological factors of the disease causing severe epizootics such as fowl cholera of birds and Hæmorrhagic Septicæmia of cattle; (2) conjointly *i.e.*, in partnership with some other organisms and produce the disease as in the snuffles of rabbits, which is said to be due to the joint action of *P. lepiseptica* and *Bacterium bronchisepticum* (Welser, Bull, McKee; (3) purely as secondary invaders as in canine distemper, equine influenza and in the opinion of Möller, Schmidt, Hegyeli, Schalk, Roderick and others, also in Swine plague.

Immunity.

The problem of immunity in Pasteurelloses seems to find a comparatively easy solution; it is often observed that an outbreak of the disease can come to a spontaneous standstill without having caused a heavy toll of animal lives. Of course one also encouters instances where the loss is unusually high. It is to avoid such undesirable results that other means of combating the diseases have to be sought for.

Artificial immunisation against Pasteurelloses has been inaugurated by Pasteur through his classical experiments with fowl cholera. After Jenner's vaccination against Pox this was the first method of immunisation against bacterial diseases. Thus the two together have laid the foundation for the whole study of prophylactic inoculation. Pasteur used fowl cholera germs which had decreased in virulence at first by reason of their exposure to air and subsequently by their growth at different temperatures and through this established an immunity against fowl cholera. This method is now of historical interest as subsequent workers (Kitt. Cagny, Hess) showed that the method was not only dangerous, as at times, such inoculations caused fowl cholera, but the immunity conferred was not quite reliable as the birds died of the disease when inoculated subsequently with larger doses of virulent fowl cholera germs. Favourable results have been claimed by recent workers (Hadley, Gallagher, Manninger) who using living cultures obtained from a virulent strain of fowl cholera organisms have been able to protect mice, pigeons, and hens against considerable doses of virulent strains. Killed cultures of the fowl cholera organism have also been used and varying grades of immunity are reported. Ligniéres has claimed that immunity caused by *P. avicida* is also efficient against an infection by any other form

of this organism. Repeated passages of these germs through rabbits are followed by an increase in virulence for this species and a corresponding decrease for the species from which the organism has been originally isolated. This fact has been made use of in the preparations of vaccines against Pasteurelloses, for which the strains of organisms which have undergone some passages through rabbits are employed.

The mechanism of immunity in pasteurelloses has not yet been fully explained. Animals immunised against pasteurelloses have been proved to contain in their blood (*Pfeiffer*) besides agglutinines and amboceptors other antibodies such as antiaggressins, opsonins and bacteriotrophines while the presence of bacteriocidins has not yet been proved. The antiaggressin immunity seems to play a great role; many workers agree that a high degree of immunity against the diseases can be produced by using germ free filtrates or aggressins.

Nevertheless, it should be borne in mind that as in all infectious diseases, also in Pasteurellosis the course of the disease in the individual and in the herd depends on susceptibility and resistence of the animal on one side and the infecting dose and virulence of the organisms on the other. Leaving these relationships out of consideration—it is impossible to consider them in clinical cases—the course of the disease in a herd may be said to be governed by the elimination of the germs and the site of infection.

Elimination.

The organisms are eliminated in quite large numbers in almost all the secretions and excretions, particularly the faeces, urine and mucous discharges (expectorations, nasal discharges). On this account every single case of Pasteurellosis, as well as every germ carrier arising as a result of an animal surviving all attack of the disease is to be looked upon as a focus of infection disseminating large masses of highly infective germs in its surroundings.

Site of Infection.

They are chiefly the digestive tract, visible mucous membranes and the external skin. Obviously it is quite impossible to protect these organs from infection.

Control of Pasteurelloses.

Any control of pasteurelloses must be directed either towards reducing the chances of infection through disinfective and other measures, or towards heightening the general or specific resistence of the animals against infection. Under the conditions existing in India

disinfective measures are possible only in exceptional cases. It is of interest to bear in mind, that those areas which have an access to the wild fauna from the neighbouring forests are under constant danger, as those wild animals that are susceptible to Pasteurelloses constitute a standing source of infection to the domesticated animals. For this reason, areas in the immediate neighbourhood of forests rich in wild swine, cattle and such other animals susceptible to Pasteurellosis should be considered as more unfavourable in the control of the epizootic in any particular area than those whose neighbourhood is forest-free. I do not know of any literature regarding the occurrence of this disease in wild animals in India and especially none about the occurrence of the so-called germ carriers among them. It may be, that in the struggle for existence which is keener in the wild state than under domesticated conditions, there is very little chance for the germ carriers to survive for any longer period. In the absence of definite information in this direction, a systematic investigation undertaken would be worthwhile and may serve a significant purpose in chalking out any plan for the control of Pasteurelloses in India.

Hæmorrhagic Septicæmia of cattle in India.

The remarks made on Pasteurelloses in general apply to the Hæmorrhagic Septicæmia of cattle which in India is responsible for a great ravage among the live-stock and a distressing economic loss to the country.

Under the conditions of Indian cattle keeping, it seems impracticable to effect a cut in the epizootic through hygienic measures (isolation, disinfection, etc.). One has therefore to resort to means of raising the resistence of the animals against infection during the time of greatest danger. Attempts to raise the general resistence of the animals through good feeding, prevention from colds, and in short, such measures as would present them with increased vitality cannot find universal application. On this account stress has to be laid on measures that would provide the animals with heightened specific resistence, otherwise called artificial immunity, against infection. With this object in view the so-called passive and active immunisation methods are employed in the control of the Hæmorrhagic Septicæmia of cattle.

Passive Immunisation.

This is done by inoculating the animals with immune serum. The serum is obtained from cattle which have survived an attack of Hæmorrhagic Septicæmia under natural or artificial conditions. Cattle serum is preferred to those obtained from any other species of

animals with a view to get a longer duration of immunity and to avoid any undesirable anaphylactic reactions.

The curative effect of such an immune serum is doubtful. I do not know of any experimental evidence where among a set of diseased animals, those inoculated with serum have survived while those left uninoculated have died of the disease. Many investigations undertaken in this direction with fowl cholera have shown beyond doubt, that fowl cholera immune serum has absolutely no curative effect on birds suffering from this disease, but the birds so treated are enabled to live for a slightly longer time, the course of the disease being in such cases prolonged. Such a result is of no value in the control of fowl cholera itself, although it is welcomed by the poultry keepers who have the economical advantage of marketing the inoculated birds before they die. If similar results were to be encountered with Hæmorrhogic Septicæmia of cattle, the use of the serum for such purposes must be strictly forbidden.

On the contrary, the application of passive immunity as a protective or prophylactic means against Hæmorrhagic Septicæmia of cattle appears to be encouraging (Holmes, Sheather, Benett). The effect of passive immunisation establishes itself immediately and lasts for about 3—4 weeks (Holmes).

Serum alone inoculations have their chief application in infected localities where it is intended to protect the still healthy animals from infection from their diseased companions. In such localities the active immunisation appears to be contra-indicated, as during the initial stages of the development of the intended active immunity the animals are in the so-called negative phase, which renders them highly susceptible to infection. For further application compare 3, under active immunisation.

In a locality where Hæmorrhagic Septicæmia has broken out among cattle, success may be achieved through passive immunisation, by repeating the serum alone inoculations at intervals of 3—4 weeks, till the epizootic completely subsides. On economical grounds such repeated inoculations cannot find an extensive application, as the cost of production of the required serum would be enormous. For this reason it is necessary to limit such inoculations :—

1. to animals such as those intended for breeding purposes, heavy milk yielders and those which are otherwise valuable.

2. to those cattle which are taken to markets, cattle shows or any such gatherings, during the prevalence of Hæmorrhagic Septicæmia. A legislature to this effect would be necessary and should enforce that every animal before leaving its area for any

gathering must be protected with serum alone inoculation and must be certified as such, by the area veterinarian conducting such inoculations. Such measures may tend to avoid any undesirable spread of the disease.

Active Immunisation.

Active immunisation of cattle against Hæmorrhagic Septicæmia is accomplished through inoculating the animals with dead Hæmorrhagic Septicæmia organisms (bacterins) living but attenuated Hæmorrhagic Septicæmia organisms (vaccines) or finally with germ free extracts of oedemas or laboratory cultures (natural or artificial aggressins). The active immunity does not manifest itself immediately and is therefore not indicated in the animals which are already infected, or those that are in immediate contact with them.

It is assumed that the immunity begins to establish itself in 2—4 weeks after the inoculation, although definite proofs for this are not known. The active immunisation is, on this account, regarded as a purely prophylactic measure. The efficacy of this immunity is open to doubts. Although the results of field experiments are looked upon as being highly favourable (Sheather), contradictory results are reported under laboratory conditions (Doyle). In the absence of any uninoculated controls in such field experiments, the fact that Hæmorrhagic Septicæmia of cattle can at times come to spontaneous standstill seems to have been ignored ; it is therefore possible that the results of field experiments are over-estimated. Obviously under such contradictory observations it would not be safe to take any one for granted, until exhaustive experiments with controls are undertaken in this direction.

It is beyond the scope of this article to enter into a detailed description of each of the several methods of active immunisation. The immunity produced by such methods is said to last for 6-7 months. Subject to the above uncertainty regarding its efficacy active immunisation of cattle against Hæmorrhagic Septicæmia should be undertaken :—

1. In the more remote surroundings of the locality where the epizootic has broken out, the object of such a measure is to create a belt of actively immune animals around the infected locality and thus localise the disease to the infected area. Such attempts at localisation of the disease are apt to effect a cut in the course of the epizootic.

2. In areas not in close neighbourhood of the infected localities, but where, there are seasonal outbreaks of Haemorrhagic Septicæmia among cattle, inoculative measures should he undertaken well before the beginning of such seasons.

3. In combination with serum, following the serum alone inoculation after a suitable interval of time, when undertaken in infected areas and in those of its immediate neighbourhood, it may be possible, firstly, to gradually convert a temporary passive immunity into a lasting active one, and secondly, to avoid the repetition of the expensive serum alone inoculations.

From the above arguments one is led to conclude that in an outbreak of Hæmorrhagic Septicæmia of cattle in a locality any measures of control must be directed not only to the infected area but also to those surrounding it. For this reason the animals in direct contact with the diseased and those of the immediate neighbourhood should be protected with passive immunisation, and those in the remotest surroundings with active immunisation. By establishing such belts of immune animals, it is believed that the course of the epizootic may be cut short.

With achieving such results the goal is not reached. The ultimate aim in combating the Hæmorrhagic Septicæmia of cattle is not to create such localisations of the disease, but to have in view the complete extermination of the disease from one area after another till it is extinct from the country.

An extensive investigation is, however, necessary in order to make out the best possible methods of combating the Hæmorrhagic Septicæmia of cattle in India, under the many different climatic and other conditions existing in the country. It is needless to mention that facilities for carrying on such a work are not enough. Many well equipped research centres are necessary for this purpose. Each centre must work out the problems suitable to the conditions existing around it. The day may not be far off, when decidedly better results, than at present, will crown the endeavours of systematic workers in this field.

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EXPERIMENTAL FACTS ABOUT THE USE OF ARSENIC TRIOXIDE IN THE TREATMENT OF CHRONIC CASES OF THRUSH IN HORSES.

BY

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The term thrush is applied to an affection of frog brought about by neglect of feet and careless shoeing. The ordinary course of treatment varies with the severity of the disease and is principally based on cleanliness and adequate shoeing.

I have had a number of cases of thrush, which came to me for treatment and they got well by careful hygienic and local medicinal treatment. Attention to shoeing in some cases demanded the heels to be lowered considerably, others were shod with tips and some were left unshod to ensure proper functioning of the frog and thereby its development.

I felt a great difficulty in certain advanced cases, most of them having thrush in all four with considerable amount of suppuration. In such cases a course of Arsenic was suggested to me by Brigadier H. S. Stewart, which I tried with very good results. I was also told that at the Muktesar Laboratory, it was found that Arsenic had

some action in curing cases of thrush, when that drug was under trial against Surra in horses.

Arsenic Trioxide was used and was given orally mixed with a little quantity of food in the following dosage :—

1st day	16 grs.
3rd „	„ „
5th „	20 „
7th „	„ „
9th „	24 „
11th „	„ „
13th „	28 „
15th „	„ „
17th „	32 „
19th „	„ „

In carrying out this treatment one should be careful to watch for toxic symptoms and if observed the course should be stopped and continued again after a couple of weeks or more.

In certain cases one course of treatment did not show much improvement and after an interval of three weeks, I gave another course. The doses given above are for an average sized Waler.

FISTULA OF THE WITHERS AND POLL OF THE HORSE.

BY

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In treating fistula of the poll or withers of the horse, the existing conditions are suggestive of the detailed procedure but not of the treatment proper.

Should the case present openings into the fistulous sacs remove all the detached substances. If there are no openings determine if there is any detached substance—if so, make an opening at the lowest point and remove same. Otherwise do not open even though the sacs contain sero-purulent fluid.

Never inject the cavity with any fluid antiseptics or wash the outer surface with water.

If forced to make an opening into the sac let it be as small as possible to accomplish your purpose and let that one interference be the last time you disturb the inside of the fistula.

Use a firing iron made of one half inch round iron at the base the point three eighths inch thick by three quarters to one inch long. Heat it in ordinary coal or charcoal fire—(the gasolene heated thermo-cautery will probably cause extensive sloughing of the skin), puncture the muscles of the neck on both sides of the neck at a point half way between the poll and withers about 4 to 6 inches below the funicular portion of the ligamentum nuche. This puts the punctures in the scaleneus and other muscles of the neck. Put the iron in full depth of point making a surface like the following . . . Make punctures one to one and a half inches apart. . . .

In two or three days remove scabs from punctures to prevent burrowing of fluids under the skin. Do not interfere with them otherwise—they will heal promptly and in a few months will be scarcely visible if at all, when, the horse is clipped. From two to three weeks the average case is well, It is necessary of course to prevent the patient from rubbing the fistula. If he will not rub and if the weather permits the pasture is the better place for him.

In cases where there was no opening in the sack and its contents were serous or sero-purulent it has frequently occurred that by metastasis the contents of the sack is carried from poll to withers and conversely. Even then it usually disappears but takes a longer time- If it does not, fire again between the first punctures.

ENDOCRINOLOGY AND REJUVENATION: MONKEY GLANDS GRAFTED ON HUMAN BODY.

BY

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The value of hormone theraphy has of late been the topic of the day both in medical and veterinary professions alike. The progress of our knowledge of the endocrine glands during recent years has considerably proved their worth for therapeutic use. Therefore the importance of an adequate supply of hormones from the various endocrine organs cannot be over-estimated.

One of the most important phases of animal physiology is said to be the control exerted by the ductless glands, over the various systemic functions. The endocrine glands have been known to control certain vital functions, by virtue of the substances they secrete and these substances are carried to the organs for which they are intended. Among the important functions depending upon

the glands of internal secretion are sexual development, pregnancy skeletal growth, etc.

Now-a-days endeavours are being largely made by the physicians to employ gland products from cattle, sheep or wherever possible, raw glands from monkeys to replace either loss of economy or deficient secretions in the body and to awaken, to renewed activity, dormant or impaired glandular functions.

A short while ago one of the leading medical practitioners of Calcutta, subjected a young Hindu girl of seventeen, of a respectable Indian family, to an operation in which two monkey ovaries, removed by me from a healthy virgin monkey (*macacus rhesus*), were immediately engrafted into her buttocks. Despite every possible medical aid and her being in full youth, the girl was devoid of all natural signs of womanhood. She has since been known to be progressing well. The monkey on the other hand was none the worse for the loss and was alright in about ten days after.

A reference to the above under the caption "An Interesting Operation in Calcutta" appeared in one of the leading English dailies, which said that an operation of a most interesting nature and unique character was performed on a girl who had not developed any signs of womanhood, such as menstruation, &c., though she was then seventeen years of age. This is unusual among Indian girls. Her guardian had her treated for the last four years, but without any benefit to her.

The ovaries of a healthy monkey were engrafted soon after removal into the buttocks of the girl with the idea of stimulating her ovaries unto activity through the agency of the "Internal secretions" of the engrafted ovaries.

There have been a few cases of such operations performed successfully in Germany. No such cases have yet been recorded in India.

Details of the case:—A Hindu girl, seventeen years of age, came to the attending surgeon for treatment for the following complaints.

(i) She never had menstruation though she was seventeen years old.

(ii) No development of the mammary glands.

Previous treatment already adopted:—She was given for one year Extract of Thyroid, Parathyroid & Ovarian glands, Pituitrin tablets, &c., but without any benefit.

Physical examination:—Stout, strong, dwarfish, eyebrows prominent with thick hair. Very little hair over the whole body was a notable feature.

Hereditary history revealed nothing. Heart, lungs, kidneys normal. Examination of external genetalia revealed nothing abnormal or pathological.

Treatment subsequently deliberated on was an ingrafting operation, in which the ovaries of a healthy monkey were to be ingrafted. Accordingly a young and healthy virgin monkey was purchased.

Modus Operandi:—The monkey was anasthetised and oophorectomy was performed. The ovaries were then immediately placed between two wards of cotton in sterilised normal saline solution and immediately transferred over to the Surgeon. While this oophorectomy in the monkey was going on, in the midst of an anxious crowd of medical men at the girl's residence, where surgical arrangements were made, the human patient, on another table, almost simultaneously, was prepared for her turn. The ovaries were ingrafted deep into the muscles of the buttocks of the girl.

This is one of the many instances where a Veterinarian can be of service to a member of the medical profession.

EXAMINATION OF PATHOLOGICAL URINE IN DOGS

By

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The recognition of changes occuirrng in urine is a great help in diagnosing many disorders of the animal system. In health little qualitative variation is to be seen, but a definite change occurs in disease. Renal affections can only be diagnosed with precision by the aid of a chemical and microscopical examination of urine. Clinically, except in the dog, little is known in regard to renal diseases particularly in bovines, but examination of the urine is of vital importance as changes may be produced by disturbance of the digestive, circulatory, respiratory, or nervous system.

The kidneys are the chief organs that excrete non-volatile substances from the body and the main functions of the kidney are:—

1. Removal of certain waste products of nitrogen metabolism and in particular the excretion of urea and uric acid.

2. Removal of acid products and thus maintain the H ion concentration of the blood.

3. Maintenance of the optimum concentration of salts in the fluids and tissues *i.e.* maintenance of osmotic pressure of the blood at a constant level.

4. Excretion of many toxic materials artificially introduced (animal, vegetable or mineral).

For a thoro ugh systematic examination it is necessary to get a sample from the urine passed during the previous twenty-four hours, The only correct way to collect ' twenty-four hour urine ' is to begin the metabolism period immediately after passing the night urine in the morning. Note the time and then collect all the urine passed to the same hour, the following morning. The reason for this rule is that during the night much of the waste products corresponding to the food in-take of the preceding day is passed and in the early morning before any food is given, the excretion is at its lowest level. Usually it is impracticable to collect twenty-four hour urines in animals, then it is desirable to study the urine, representing shorter metabolism periods such as three, four or six hours. It is necessary to use some preservative for the urine unless the analysis can be completed within twenty-four hours. Chloroform (2 cc.) or Toluol or Xylol should be introduced into the empty bottle in which the urine is to be collected so as to exclude from the beginning any possibility of bacterial decomposition. Chloroform is a reducing agent and consequently may confuse tests carried out by reduction of reagents. Thymol crystals may be added but this also may confuse certain tests. Toluol is the best preservative. Examination of uric acid should be made the first day because uric acid may either fall out as a sediment or may decompose as the result of long standing. The creatinin determination should be made within forty-eight hours because in some urines it is gradually in part converted into creatin.

The approximate percentage of composition of urine is given below as noted in Benham's Posology.

Components	Horse	Cow	Sheep	Pig	Dog
(1) Water ...	90	91·5	86·5	97	...
(2) Organic matter urea, uric acid, hippuric acid ...	7·0	6·5	9·8	2·0	...
(3) Inorganic matter, salts of potash, soda, phosphorus etc. ...	3·0	2·0	3·7	1·0	...
Total ...	100·0	100·0	100·0	100·0	
(4) Quantity of urine voided daily, in pints ...	8-10	40-48	3/5 4/5—1	2/5 2/2	3/4 to 1 ½

URINARY ANALYSIS.

Table showing the results of examination of urine in Dogs.

Animal.	Colour.	Reaction.	Sp. Gr.	Albumin.	Blood.	Sugar	Bile Salts.	Bile Pigments.	Acetone.	Indican.	Creatinin.	Urea.	Chlorides.	Glycuronic acid.	Deposits.	Date of Examination.
1. Dog	Straw coloured	acid	1018	+							+	1·9%	+			6-10-32
2. Dog	do	acid	1016	|				+			+		+			8-10-32
3. Dog	do	acid	1016	+							+		+			8-10-32
4. Dog	do	acid	1020	+							+	1·5%	+			7-11-32
5. Dog	do	acid	1019	+						|	+	1·7%	+			9-11-32
6. Dog	do	acid	1018	|						+	+	1·6%	+			9-11-32
7. Dog	do	acid	1011	|						|	+	1·7%	+			11-11-32
8. Dog	do	acid	1016	+						|	+	1·9%	+			14-11-32
9. Bitch	do	alkaline	1010	+	+					|	+	2·0%	+			22-11-32
10. Dog	do	acid	1037	|						+	+	1·9%	+			29-11-32
11. Dog	do	acid	1010	+						+	+		+			25-11-32
12. Dog	do	alkaline	1030	+						|	+		+			28-11-32
13. Bitch	do	acid	1025	|						|	+		+			30-11-32
14. Dog	do	acid		+						|	+		+			1-12-32
15. Dog	do	acid		+						|	+		+			5-12-32
16. Dog	do	acid		+						|	+		+			6-12-32
17. Dog	do	acid		+						|	+		++			19-12-32
19. Dog	do	amphoteric		|					+							19-12-32
20. Dog	do	acid		+						|	+	1·9%	++	very little	19-12-32
21. Dog	do	acid	1016	+						|	+	1·9%	+·1%	O	31-12-32
22. Dog	do	acid		|					|	+	1·7%	·082%		6-1-33
23. Dog	do	acid	1010	+						|	+			very little	6-1-33

The composition of urine varies according to the nature of food, age of the animal, and whether it is at work or repose, the time of day etc.

The enclosed table shows the number of samples of urine examined by me at the Royal (Dick.) Veterinary College, Edinburgh together with the results.

The tests employed in the laboratory are as follows:—

Specific Gravity is ascertained with a hydrometer.

Albumen:—Heat plus acetic acid.

Cold nitric acid.

Quantitative estimation by Esbach's method.

The appearance of albumen in the urine is of importance as an easily recognisable diagnostic sign of disordered function of the kidneys. The kidneys become permeable to colloids and albumen appears in the urine.

Blood:—Haemoglobin by the Guaiacum tests.
Blood by microscopic examination of the deposits for blood cells.

Sugar:—Fehling's test; Nylander's test; Benedict's test; Fermentation test.

Bile:—Pigments by Gmelin's test. Salts by Hay's sulphur test.

Acetone:—Lange's test. Acetone is generally present in diabetic urine.

Indican:—Chloroform test. It is present in all conditions which augment intestinal decomposition.

Creatinin:—Weyl's test.

Urea estimation:—Doremus Ureometer with alkaline hypobromite solution.

Chlorides:—Volhard's method.

Glycuronic acid:—Tollen's reaction. It is absent in urines in hepatic derangements.

Deposits:—The urine is centrifuged at 2,500 revolutions per minute. Films prepared, stained by methylene blue and examined with $\frac{1}{12}$ objective.

Conclusions.

Renal affections are very common in dogs.

Albumin is the most common abnormal protein found in dog's urine.

2 Sugar was only found in one sample of urine, and it is not possible to confirm that it is a case of real diabetes unless a number of such cases are examined, and know clearly whether Glycosuria is of alimentary, renal, hepatic or pancreatic and endocrine origin.

The above tests are usually followed by Professor Geo. F. Boddie, B. Sc., M. R. C. V. S., and his colleagues in the clinical department of the Royal (Dick.) Veterinary College, Edinburgh, for examining samples of urine as an aid to diagnosis.

My grateful thanks are due to Professor Geo. F. Boddie, B. Sc., M. R. C. V. S., Professor of Medicine, Royal (Dick.) Veterinary College, Edinburgh, for the help and facilities offered to me in carrying out the above tests.

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Clinical Articles

FIBROMA OF THE BLADDER IN A DOG.

By

R. Swaminatha Ayyar, B.A., G.M.V.C.,
Veterinary Assistant Surgeon, Ootacamund, Madras.

Subject :—A Dachshund dog, age nine years.

History :—When first the dog came under my observation, it was suffering from double perineal hernia. He was operated on for this on 29-8-31, with only partial success. The hernia on the right side reccurred after a couple of months. This recurrence caused a very bad constipation, which was relieved by regular administration of liquid paraffin and enemas. Even then, it was a common sight to see the dog straining for nearly ten minutes at a time, only to pass a few hard pellets of fæces. As time passed on, the constipation and straining increased and the dog was slowly and steadily losing condition. It was then noticed that the dog had great difficulty in passing urine. For the first and last time, on 5-1-32, the urine was noticed

to be bloody. It was at once properly dieted and treated with urinary sedatives. The dog became alright to all appearances. Examination of the bladder did not reveal any calculus. About two months after, on the 2nd March 1932, the dog was again brought to me with very urgent symptoms of complete suppression of urine for over 24 hours. Examination of the bladder revealed a highly distended organ. Slow and steady pressure soon emptied it and an examination made after this showed the presence of what appeared to be either a calculus or a growth in the bladder. An operation was decided on and was performed on 4th March 1932.

Operation :—Having induced general anaesthesia with chloroform, an incision about 3 inchas long was made parallel to the linea Alba on the side of the prepuce, and the abdomen entered. The bladder was caught and examined. No stone was found and the presence of a neoformation was definitely ascertained. The size of

this growth was so great (*vide* photograph) that the abdominal incision had to be extended to about 6 inches before it could be brought out. It was then found to be attached to the base of the bladder on the outside. With fine dissection, the attachment was severed, blood vessels ligatured and the growth removed. The hæmorrhage from the bladder was arrested by scarification. The abdominal wall was then sutured—muscles and skin separately—and the animal allowed to recover from the anaesthetic.

There was a rise of temperature on the 3rd, 4th and 5th day and the general condition of the dog also was not quite satisfactory. An intravenus injection of 5 ms. of tincture iodine in 5 c.c. of water was given on the 3rd day and this was followed by daily oral doses of tincture iodine (m ii) for 3 days. This brought the temperature down and, thereafter, the recovery was uninterrupted.

The dog began to put on condition soon. and now 10 months after—it is quite healthy and well.

The growth, which weighed 1 lb. 3 oz., was kindly examined by the Principal, Madras Veterinary College, and reported to be a "Fibroma."

Discussion :—This growth must have been growing slowly for a long time, and, as its weight increased must have drawn the bladder forward, causing difficulty in urination. The strain thus induced must have been the primary cause of the perineal hernia; and the failure of the hernial operation on one side is evidently due to the growing tumour.

My thanks are due to Mr. V. D. Ratnam, G. M. V. C., Touring Veterinary Assistant Surgeon, Ootacamund, for kindly helping me in the operation.

INFLAMMATORY GRANULOMA OF THE TONGUE OF BLACK LEOPARD, AT THE VICTORIA GARDENS, BOMBAY.*

BY

D. S. LAUD, G.B.V.C., F.R.H.S., F.Z.S.,

Superintendent, Victoria Gardens, Bombay.

Subject :—Black Leopard, (*Felis Pardus var-Niger*).

This Black Leopard has been the inmate of this Zoo since 25-7-1920 and came to the Gardens as an adult.

History :—For over a year a tumour of the size of pin head was noticed on the right side on the tip of the tongue, and later it gradually increased in size, till it was of the size of a big marble. The tumour caused no worry to the animal except that it bled during prehension. The animal remained in perfect health and its appetite was excellent.

Treatment :—It was decided to remove the tumour by excision and consequently the animal was removed from the Park-cage to the Animal Infirmary in the Gardens.

Mr. Hira, Veterinary Surgeon to the Karachi Municipality in his Notes on Operation on a Tiger in the "Karachi Zoo" (*vide* page 250, Vol. VII, No. 3 of the *Indian Veterinary Journal* of January 1931) stated that he had to anaesthetise the tiger with chloroform for operating on a digital abscess caused by overgrown nail. On the case now reported, no local nor general anaesthesia was used at the

*(Paper read at the Annual General Meeting of the Bombay Veterinary Medical Association, held on 24th December, 1932.)

time of operation. The animal was removed in a small moveable cage and secured by means of stout cotton ropes with the assistance of 10 keepers in keeping the animal in the dorsal position. A stout iron bar was placed in the mouth of the animal to keep the jaws open. With a pair of dressing forceps having long arms, the tumour was secured and twisted till it came off. The whole operation hardly took five minutes and there was little bleeding after the operation.

Subsequent treatment consisted in washing the mouth with a mouth wash of Condy's Fluid, 1 in 20, by means of a Garden Syringe. The animal was transferred the next day to the Park-cage and the mouth wash continued for a week. The Leopard is perfectly alright now and is feeding well.

The tumour was sent to Dr. V. R. Kanolkar, M. D., (Lond.) B.Sc. (Lond.), Professor of Pathology at the Goverdhandas Sunderdas Medical College, Bombay, who very kindly examined it for me. He said that the tumour appeared to be an inflammatory granuloma with surface necrosis and ulceration.

FÆCAL IMPACTION OF THE INTESTINES IN A SIAMESE CAT.

BY

M. V. PILLAI, G.B.V.C., PENANG, F.M.S.

A half-bred Siamese cat was brought to me for treatment by a European lady on the 2nd August last year, with the history that the animal had been off its feed and was badly constipated for over ten days. The cat was found to be very dull, and unwilling to move. The temperature was found to be normal. At first sight, the cat did not seem to be in pain or in any way uncomfortable, in spite of the continuous fast. On manipulation of the abdomen, a hard mass was felt which made one suspect for impaction. Examination per rectum also showed distinct signs of the same. Ordinary treatment consisting of a laxative medicine did not bring about the desired effect. Attempts to soften the mass with glycerine enema and constant massage also failed.

I advised the owner to have it operated upon, the owner on the other hand wanted to have the animal painlessly destroyed. Accordingly the cat was destroyed and the post-mortem examination revealed a hard mass of faecal matter which looked petrified, more or less, and it weighed 10 oz. The portion of the gut that was in contact with this was beginning to be gangrenous.

'EGG-BOUND' IN A CAGED ZANZIBAR GREY PARROT.*

BY

K. R. S. AIYAR, G. B. V. C.,

Laboratory Assistant and Lecturer, Bombay Veterinary College.

A friend of mine Mr. D. one morning called on me and sought my advice and treatment for his sick parrot.

The history of sickness was that the parrot, a caged bird for over 25 years, suddenly went off its feed. I advised him to give 2 or 3 'cut-end-quill-fulls' of castor oil and report the result after 24 hours.

Next day I was informed that the parrot was passing blood in its droppings and looked worse and at my request the parrot was brought to me and on examination I found that it was straining frequently. An explorative examination of the cloaca revealed the presence of an abnormal egg impacted in the cloaca. In my attempt to dislodge the egg I broke its shell, resulting in emptying the contents of the egg and the shell pieces were then carefully removed with little injury to the mucous membrane of the cloaca. The parrot was given a wash with potassium permanganate 1 in 1000 for two days and it made an uneventful recovery.

This is the first time I saw an unfertilised egg in a caged female parrot.

A CASE OF ENTEROLITHS IN HORSE.

BY

W. V. SOMAN, G. B. V. C., (BOM).

Chief Veterinary Surgeon, Baroda.

A team of six Irish horses belonging to Shrimant Yuvraj Pratapsinha Raja of Baroda, landed in India at the end of November 1932. After giving complete rest for about a week, they were gradually put to work in harness. On December 8th, one of the horses was reported to have suddenly developed symptoms of colic. Before any aid could be obtained he dropped down and died within a few minutes.

He was about eight years of age and looked quite strong and healthy. On the morning of the 8th, he was used in harness for about two miles. In the evening at about 4 P. M. he was led in hand a

* (Paper read at the Annual General Meeting of the Bombay Veterinary Medical Association, held on 24th December, 1932.)

short distance when suddenly he stopped, showed colic, sat on his haunches, fell on the ground and with little struggling was found dead within a few minutes.

Post-mortem examination revealed a ruptured diaphragm which perhaps was the immediate cause of death. There were three calculli weighing about 111 lbs. found lodged in the colon and all of them were together in the pelvic flexture.

No signs indicative of their presence were ever noticed since the arrival of the horse and he kept up fairly good health.

All the calculii varied in shape and the 1st on the left which was the largest weighed well over 41 lbs. The third one which was prismatic, was found lodged in the flexture. One interesting thing noticed was the shape of the facets and they looked as if they were in apposition with each other.

The calculi appeared greyish in colour with fine hairy surfaces probably from oats and when cut in section, showed cocentric structure from the centre to the circumference. No foreign body was found in one of the stones which was cut for analysis, and it was found to contain 97·77 per cent. Magnesium Ammonium Phosphates with 20·22 per cent. of other organic matter. ($Mg.NH_4PO_4.6H_2O$).

My thanks are due to the Industrial Chemist to the Government of Baroda for the analysis.

AN UNUSUAL CASE OF RABIES IN A DOG.

By

G. A. Ajwani, M. Sc., D. V. M., D. V. H.,

Offg. Lecturer in Pathology & Bacteriology,

Madras Veterinary College.

AND

R. Venkataraman, G. M. V. C.,

Assistant Lecturer, M. V. C.

Subject.—A bull terrier dog. O. P. No. 2140,

History:—The case was admitted on 18-2-31, in the Madras Veterinary College Hospital with the complaint that it had been vomiting for two days. The vomition stopped and was succeeded by unsteady gait with retention of urine which was subsequently removed by passing a catheter. It was off its feed completely, moaning and restless; the tongue was partially paralysed. There was a swelling of the head and neck which disappeared after putting on an antiphlogistine poultice. The dog died on 19-2-31 at 3 a. m. and was postmortemed the same day.

Post-mortem findings:—The carcase was fair in condition. On opening the abdominal cavity, the spleen was found considerably enlarged nearly three times its normal size. The liver was enlarged, congested and friable. The stomach was empty and the intestines presented punctiform hæmorrhages in places with catarrhal condition of the mucous membrane of the jejunum. The bladder was distended with eight ounces of straw coloured urine and the mucous membrane presented nothing unusual. Both the kidneys presented nothing unusual. The diaphragmatic lobe of the right lung was congested, the cardiac and apical lobes being partly emphysematous and paler than normal. The cardiac and diaphragmatic lobes of the left lung were slightly congested. Pieces from the several lobes floated in water. The blood vessels over the epicardium were congested; all the chambers of the heart contained clotted blood and right side of the heart was distended. Smears from the heart, liver and spleen revealed nothing unusual.

On opening the skull, inflammation of the cerebral meninges was observed. Since this lesion together with hyperemia of the liver and spleen and empty stomach and catarrhal condition of the jejunum led to the suspicion that it might be a case of rabies, examination of the brain was resorted to, when Negri bodies were found

in the impression preparation of the hippocampus major. This was subsequently confirmed by microscopical examination of the sections at this laboratory. Simultaneously with this a portion of the brain was sent to the Director, Pasteur Institute, Coonoor, who also confirmed the same for rabies. The cause of death was recorded as rabies.

A CASE OF IMPACTION IN A PONY WITH SILK WORM COCOONS

BY

S. K. SUNDARAM, G. M. V. C.,

Veterinary Inspector, Sira, Mysore.

Introductory:—In silk worm rearing areas, it is a common occurrence to see animals ailing with impaction of the gut, ending fatally in almost all the cases. Dogs very often ingest the cocoons with no different fate. Cattle and horses are fed on mulberry fodder, in small quantities as it has a good laxative action. The animals get quite accustomed to the flavour of the mulberry fodder. Occasionally one observes animals gulp a mouthful or two of the cocoons from the plate, where they usually throw mulberry leaves to feed the worms.

Subject:—An aged pony.

History:—The animal was observed on 28—3—1931, standing loose near a plate of cocoon. The owner observing the disturbed plate, surmised that the pony might have eaten some cocoons. On 29—3—31, the pony exhibited symptoms of colic. He was fed that day with more lucern, as he would not take his usual grass feed. He passed loose faeces which contained about 8 ounces of cocoon, and looked apparently in good health. The same night, the pony got loose again and secured a chance to gulp more cocoons, which was observed early next morning.

On the morning of 30-3—31, the animal had slight colicky symptoms, which became prominent during the latter part of the day. No quackery treatment was spared in any way, before I was requisitioned to treat the animal on 31—3—31.

Symptoms:—At the time of visit, the animal was lying down, with high flatulence. He was restless and was not straining much to pass faeces.

Diagnosis:—Impaction of the gut with silk worm cocoons.

Prognosis:—A guarded prognosis was given.

Treatment:—A copious warm soap water enema was given and a mixture containing, Ol. Lini. xiiℨ Ammon Carb iℨ, Ol. Turpentine iℨ, Tr. Nuxvomica iℨ, was given at 9 a.m. An hour later occasional passing of faeces was observed which encouraged me much.

10-30 a.m. ii grains of Eserine Sulphate in 3 c.c. of distilled water was injected hypodermically. At 11 a.m., the animal began to strain most violently and passed a handful of loose dung. The flatulence did not subside and for want of facility to do Paracentesis operation, I had to resort to only medicinal treatment.

2 p.m. Condition was same except the animal getting exhausted; a mixture containing, Ammon Carb, Ol. Turpentine, Tr. Nuxvomica aa iℨ Treacle one pint was administered.

5 p.m. No improvement had been effected by the above treatment. Considering the condition of the patient I was prompted to adopt a drastic method instead of wait and see.

A second dose of Eserine 1½ gr. Strychnine Hydro. Chlor. 1 gr. in 3 c.c. of distilled water was given hypodermically. But the condition remained unaffected except for violent straining.

9 p.m. The animal passed the cocoons in three lots, the total quantity weighing about 6 pounds, which relieved the animal of its suffering and the owner of his anxieties.

Remarks:—In cases of impaction, experience prompts me to rely more on Physostigmine sulphus, than the usual oral dose of medicines. The energetic contraction of the muscles of the gut, perhaps displaces the impacting material specially when the offender is of soft consistency.

Notices of Drugs.

SULFARSENOL IN THE TREATMENT OF NERVOUS COMPLICATIONS OF DISTEMPER IN YOUNG DOGS.

Extract of article by Pierre Vanpoperinghe, Veterinary Surgeon.

SULFARSENOL.

Posology:—It is difficult to state exactly the doses of Sulfarsenol to use. As for all Arsenicals, the reactions of the medicament are not in direct bearing with the doses injected, the stature and weight of the patients. There is a kind of individual sensibility and special idiosyncracy in each subject. That is why it is necessary at first to use relatively weak doses to test the organism of the patient.

The average doses for the 1st injection are : -

1st	injection	dose injected	6 ctgr.
2nd	„	48 hours after	12 „ 18 „
3rd	„	on the 4th day	24 „
4th	„	„ „ 6th „	30 „
5th	„	„ „ 8th „	30 „
6th	„	„ „ 10th „	30 „
7th	„	„ „ 12th „	24 „
8th	„	„ „ 14th „	24 „
9th	„	„ „ 16th „	24 „
10th	„	„ „ 20th „	24 „

If by chance any disturbance is noticed, it is an indication to lessen the doses and then gradually increase them again or the doses may be divided and the number of injections increased accordingly. For animals which tolerate the treatment well, our aim is to reach as soon as possible a relatively high dose—for example 30 ctgr. for a dog of 8 kilos in order to quickly obtain in the organism a strong concentration of Sulfarsenol. The excellent results of the product are generally felt after the 6th injection, that is to say towards the 8th or 10th day of treatment. To avoid relapses which are always tedious, treatment should not be stopped, but should be continued at least up to the 10th injection that is up to about 20 days treatment.

Sulfarsenol used in all the stages of Distemper gives very good results. If used as soon as the first symptoms show, Sulfarsenol checks the progress of the affection and all the complications are avoided.

For animals suffering from chorea, or paralysis of recent appearance, Sulfarsenol gives 90% cure. We have treated dogs which had been paralysed in the hind legs for about 8 days and which after the 5th or 6th injection of Sulfarsenol, recovered their power of movement. At the same time we have noticed cases of chorea localised in the hind quarters the cure of which was obtained after 2 injections. This fact is rather rare. The choreic attacks generally lessened in number towards the 4th or 5th injection, and disappeared afterwards after a time which varied according to the individuals.

SULFARSENOL IN THE TREATMENT OF SERIOUS NERVOUS LOCALISATIONS OF DISTEMPER IN DOGS.

Extracts from "La Revue Veterinaire" and Journal De Medicine Veterinaire Et De Zootechnie," Reunis.

By

Ch. Monpert

Veterinary Surgeon.

Observation :—Small Cocker bitch, 10 months old, weighing 6 kilos. This animal was brought to us on 12th February 1927—and was showing alarming clinical symptoms of nervous localizations due to Distemper.

The chief symptom was Paraplegia. The hind quarters, incapable of moving, refused to keep up the body. There was complete functional weakness. The patient, when induced by its master to move, invariably fell on its side or rolled over on its back at each attempt. While lying compulsarily stretched out, it showed moreover, rythmical jerkings in its front limbs, in the trunk, in the cervical region and in the jaws (6 to 8 per minute during our first examination). Prehension of solid food was impossible in spite of the fact that the appetite was distinctly preserved. The nose spasmodically struck the ground and the patient was unable to raise its head. In order to feed it, the owner told us that he had to keep its head above a plateful of bread and milk. Whenever the head was freed, it fell into the food, where it splashed about but the patient shaking vigorously could no longer eat.

Commemorative :—In about five weeks' time purulent conjunctivitis occurred which was quickly followed by St. Vitus dance. A colleague was called in. Treatment with the bromides was unsuccessful. No amelioration was recorded. The symptoms were choreic and on the other hand continued to increase, and paralysis set in.

We tried Strychnine Sulphate for lack of Sulfarsenol, but we proposed to the owner to try treatment with this arsenical compound, without much hope of a complete cure however, since the original nervous manifestations had been showing for more than 20 days and the intensity and seriousness of the actual clinical symptoms seemed to make the prognosis considerably worse.

The use of Strychnine Sulphate was useless. On the 17th of February 1927, we received from the laboratory of Biochemic Medicale, ampoules of Sulfarsenol and we immediately gave subcutaneously a first injection of 3 centigrammes Sulfarsenol behind the shoulder.

We repeated the injection 48 hours later; the dose being 6 centigrammes. The third injection was only 2 centigrammes as there was some delay in the complimentary Sulfarsenol which we had asked, reaching us. Afterwards the following injections were given :—

17th	February	...	3 centigrammes.
19th	„	...	6 „
21st	„	...	2 „
24th	„	...	9 „
26th	„	...	12 „
28th	„	...	15 „
2nd	March	...	18 „
4th	„	...	21 „
7th	„	...	24 „
9th	„	...	24 „
11th	„	...	27 „
14th	„	...	24 „
16th	„	...	24 „
18th	„	...	24 „
20th	„	...	24 „
22nd	„	...	24 „
24th	„	...	24 „
26th	„	...	24 „

A very marked improvement showed after the 5th injection. To the surprise and also to the satisfaction of the owner, the patient at first tried and then succeeded in eating by itself; after a little while it got up and commenced to move although in a staggering way. Paralysis of the hind quarters disappeared.

Improvement continued and rapid progress was made. On 7th March the patient showed only a few slight cervical jerkings and also a few movements in the lower jaw—reminding one of hiccup. Its walk became normal, apart from a few infrequent stumbling steps. It then became quite bright, barked, frisked about and was quite playful. We continued the injections in doses of 24 centigrammes right up to 26th March 1927, in order to saturate and maintain the organism in "a veritable arsenical bath" and at that date cure was complete.

The medicament administered entirely by the subcutaneous route had been well tolerated, even in the biggest dose. Oedema and a little pain were noticed at certain periods during the course of the injections, but these disappeared without any trouble after 5 or 6 days.

The appetite had always been excellent and gave the organism power of resistance. We advised chopped raw meat as food. Cod liver oil although recommended could not be administered as it caused vomiting.

In treating our patient, we were prompted by the indications contained in the thesis of our colleague Dr. Babb, Veterinary Surgeon, Paris, and the observation which we have related corroborates his conclusions.

Sulfarsenol is very easily employed. It possesses a certain curative action in nervous localisations due to Distemper. The interesting points of the case which we believe worthy of pointing out are that when we commenced treatment, the onset of the nervous localisation dated back for more than 20 days, that the patient was treated unsuccessfully with Bromides and Strychnine Sulphate, that the choreic symptoms were becoming worse, that there was complete paralysis which had been definitely established for several days. In a word, the clinical outlook was serious, to such an extent that, since incurability of the affection seemed inevitable, the owner had expressed his wish that the animal should be destroyed, But, on the other hand, he was quite happy to submit his bitch for experimenting and he followed our advice willingly. We confess that when we commenced treatment, we had only a very slight hope as regards the result, considering the late employment of Sulfarsenol and the presence of serious lesions already well established. We had told the owner, moreover that in any case this was the only medicament which seemed to us capable of producing any improvement or cure of the patient.

Our conjecture was greatly surpassed since a cure was effected with 38 days treatment. To-day the patient is normal and walks about as if it had never had either paralysis or chorea.

This is the first time that we have used Sulfarsenol in the case of a dog. It shows that in the treatment of serious nervous localisations due to distemper, Sulfarsenol possesses a curative action even when it is employed in almost hopeless cases and when treatment has been commenced late, similar to the case which we have just related.

Perhaps there would not be such a beneficial action in every similar case, but we wish to point out that before pronouncing a case incurable, it is necessary to try treatment with Sulfarsenol.

Successes can then be recorded for the good of the patients, their owners and the Veterinary Surgeons.

TRYPAFLAVIN IN THE TREATMENT OF FOOT AND MOUTH DISEASE.

Mayer (Deutsche Tierarztliche Wochenschrift 1920/41.)

The author has used Trypaflavin extensively in foot and mouth disease. In the very first experiments with this drug he kept controls, a measure which was abandoned afterwards when the therapeutic efficiency of the drug was practically proved.

In toto Mayer and his co-workers treated 646 animals with Trypaflavin using ½—2% solution. The total losses amounted to 2—9% only which low figures speak for the excellent action of the drug. Cases of collapsing animals, which might otherwise have proved fatal, could be saved if Trypaflavin was given in time and repeatedly. The following case is noteworthy.

A cow, 8 years old, just having given birth to a calf, suffered from foot and mouth disease for 3 days subsequently. Patient got local treatment with Trypaflavin powder together with 1 gm, of Trypaflavin perorally. On the fourth day the author was called in, since the animal had suddenly collapsed. When the author arrived she was up again. M. gave an injection into the vena jugularis having withdrawn a third of a gallon of blood previously to ease the heart function. 1 gm. of Trypaflavin was given intravenously. The repeated collapses were stopped almost immediately and disappeared entirely on the next days. 5 weeks afterwards the cow was in a perfectly healthy condition ; milking was normal.

The author concludes his publication as follows :

If not a specific, Trypaflavin is at least a very effective agent in the treatment of malignant foot and mouth disease. Mortality is decreased to a minimum and on account of the simplicity of its application, it ranks first among the preparations used to combat this disease.

MUSTARD FOR ANIMALS.

In many minor, and some major, illnesses, it is possible to treat animals through their skins, and it is here that mustard—that old and well tried friend of man—, can play its part.

The chemical composition of Mustard need not here trouble us. It will be sufficient for the purposes of this brief article if it is stated that the physiological properties of Mustard are due mainly to its volatile oil, which is liberated by rather complex chemical processes when mustard flour is mixed with water.

The primary action of this oil on the skin is to cause warmth and tingling ; the flow of blood to the surface of the body is stimulated, and any congestion is thereby relieved. Moreover, this stimulation of the circulation acts reflexly on the heart and lungs, and not only is relief from the pain suffered obtained, but the Mustard induces a general tonic effect, tending to restore a healthy condition.

The circumstances under which Mustard can be used in veterinary practice are essentially similar to those arising with human beings.

In the relief of local pain the Mustard poultice or plaster is invaluable. The size of the poultice naturally depends on the size of the animal for which it is intended and also the area of the body affected. The poultice is prepared by making Mustard flour into a thin paste with lukewarm water. It is applied to the affected area and it should be left for a period of time depending on the intensity of the pain. No poultice, however, should be left on for more than 20 minutes. In addition to the pains caused by muscular stiffness etc., such pains as flatulent colic can be relieved by the application of a Mustard poultice at the site of the pain.

Other groups of infections for which the Mustard poultice is strongly recommended are inflammatory diseases and catarrhal conditions. Pneumonia and pleurisy are treated, as in the case of human beings, by a Mustard poultice, as already described. In the case of a horse a poultice made from ½ to ¾ lb. of Mustard is applied to each side of the chest and kept there for 15 to 20 minutes. In catarrah, congestion of the lungs, and throat infections, similar steps are taken.

Febrile conditions in the smaller animals can be treated by a Mustard bath prepared by adding 1-oz of Mustard flour to every gallon of water. In such cases it is necessary to keep the animal warm following the bath.

The above conditions refer to the external use of Mustard. Mustard in small amounts given with a little chalk in warm milk forms a useful astringent to be used in the case of diarrhoea in horses. As an emetic, Mustared is perhaps the safest of all. This is because of the fact that in addition to its emetic action Mustard has a stimulating action on the heart. All other emetics have a depressing action. In the case of dogs, one dessertspoonful to one tablespoonful mixed into a very thin paste with water and given by mouth produces vomiting in one to five minutes.

Mustard is a valuable aid in the eradication of worms from sheep. A very safe and efficient method is as follows. Dissolve 4 ounces of copper sulphate in 2 quarts of hot water. Mix 4 ounces of Mustard with a little cold water, add to the copper sulphate, and make up the mixture with cold water to 2½ gallons. For an adult sheep the dose of this drench is 3 to 4 fluid ounces; for lambs 2 to 6 months old from 1 to 1½ fluid ounces; 6 to 10 months—1½ to 2 fluid ounces; 10 to 12 months—2 to 2½ fluid ounces. Starve the flock for at least 18 hours before drenching. This gives the stomach time to clear before the vermifuge is placed to do its work. Do not feed or water for at least 4 hours after drenching.

During recent years carefully controlled feeding experiments have demonstrated the value of Mustard as an adjunct to the food of laying hens. The Mustard should be added to the "mash feed" at the rate of 1 teaspoonful of Mustard to 6 birds, during the cold weather months.

In preparing a Mustard poultice or bath, boiling water or water above 140° F. should not be added directly to the Mustard flour owing to the fact that the enzyme myrosin would be inactivated. Where a really hot poultice is required it is best to mix the Mustard with a little cold or lukewarm water and allow to stand for a few minutes to enable the volatile oil to be liberated. Boiling water can then be added if desired. It is not desirable to apply a Mustard poultice to broken skin. If a poultice made from Mustard flour alone is too strong, it can be made less potent by mixing it with linseed meal or with flour.

From the explanation given of the mode of action of Mustard, and from the special indications referred to it will be obvious that the usefulness of this simple remedy in veterinary practice is very great. In this short account it is impossible to go into details of every use of Mustard, but the special indications in which the Mustard poultice or bath can be used in veterinary praetice will be apparent from the general description given above.

Notes.

Glad tidings reach us of the success of Mr. P. M. Narainasamy Naidu in the final examination for the degree of Doctorate held by the Faculty of Veterinary Medicine of the University of Leipzig, Germany. His thesis for the examination was "The result of a Critical Investigation into the Biology of Staphylococcii Pathogenic to the Domestic Animals". It is published in German and rightly dedicated to Dr. L. C. Coleman, M. A., Ph. D., C. I. E., Director of Agriculture in Mysore. We most heartily congratulate Mr. Naidu.

* * *

As a *true Scientist* he has not forgotten to secure patronage and encouragement to Veterinary Journalism in his native land. Through his kind services, this *Journal* has been introduced to the Faculty of Veterinary Medicine of the University of Leipzig. We publish elsewhere a letter from our esteemed colleague Professor Dr. Klimmer, Director of the Institute of Veterinary Hygiene of that University. We are thankful both to the worthy Professor and his pupil.

* * *

For the first time in the annals of Veterinary Services in India, an Indian has been appointed as the Director of Veterinary Services. The honour has fallen on Rai Sahib R. V. Pillai in Central Provinces. We have extracted in this issue a gazette notification announcing the appointment, though for a short period. We congratulate Mr. Pillai most heartily.

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We have extracted in this issue from "The Sunday Times" Singapore, two interesting cases of Cruelty. We wish the same stringent measures are adopted in India as well.

* * *

We invite the attention of our readers to a notable address delivered by Khan Sahib N. D. Dhakmarwala, G. B. V. C., at the annual meeting of the Bombay Veterinary Medical Association. It is not like the usual routine but deals with a few problems of great interest to the profession.

* * *

The "Hindu" Correspondent of Bangalore wrote under February 14, that "a meeting of the Bangalore District Board was held at Savandurga in the Magadi Taluk on Saturday last, under the presidency of Mr. V. Venkatappa, M. L. C., President of the Board. The Board sanctioned a sum of Rs. 10,000 towards the construction of an up-to-date well-equipped Veterinary Hospital at Bangalore, which is

to be built at a cost of about Rs. 90,000. It was a reproach all these days that the Veterinary Hospital at Bangalore City did not have a decent building of its own and we had occasion to point out this defect in a previous issue of this *Journal*. That blemish on the fair name of Mysore is, we are glad to note, shortly to be removed.

* * *

We have much pleasure to invite the attention of our readers, especially of those in the presidency of Madras to the movement to put up a portrait of Mr. F. Ware, F. R. C. V. S., I. V. S., in the Madras Veterinary College. The proceedings of the meeting held in Madras on 16-4-33 with this object in view, have been published elsewhere in this issue of the *Journal*. We feel sure that the movement will receive hearty support from the profession in this Presidency.

* * * *

We had occasion to refer in the last issue of this *Journal* to the formation of the Rural Service League in Anantapur District. We are glad to know now that this newly born League has been quite active. During the celebrations of the birth day and anniversary of the coronation of Sri Krishna Devaraya of Vijayanagaram fame, the League held on 10th and 11th February 1933, in Anantapur an Agricultural, Veterinary, Public Health, Arts & Crafts Exhibition and arranged a series of lantern lectures on these subjects. The exhibition attracted a large number of visitors who took good deal of interest in the exhibits. There may have been many such conferences and exhibitions held in other places as well, but unfortunately accounts of such events do not reach us. We shall be glad to publish in the columns of this *Journal* accounts of such events for the information and stimulation of our readers to play their part in their respective areas and thus educate the ryot.

* * * *

The Annual Report of the Imperial Council of Agricultural Research for the years 1929-30 and 1930-31, is a very interesting record of the activities of the Council.

* * * *

Para-11 of the report reads as follows:—"Animal husbandry research which should, from its importance to a country like India, where animal power is still predominantly used in the practices of agriculture, claim an equal share in the Council's activities, did not do so during the period under review." The report makes an attempt to trace the reasons for this; probably convention stands in the

way of stating all the reasons which are the actual causes, for the slow progress of veterinary science as a whole in this country. We shall not attempt here to go into all these details. Suffice it to say that our experts at the helm of the affairs of the Veterinary Departments in this country have not in the past put forth the facts and figures in a telling manner to convince the Provincial Governments of the necessity of expanding the activities of their departments for the benefit of the ryots in several directions. To do this was possible and easy in the past for the official agency alone without the help of the profession and the public support. Now that the democracy has been coming on, it is necessary that the entire profession and the public opinion should come forward to strengthen the hands of the heads of departments in their demand for greater financial help from the state to expand their activities. There should therefore be greater co-operation and closer relationship between the departmental heads, the members of the profession and leaders of public opinion.

* * * * * *

In the same para, we find "Requests for grants for schemes of research with an agricultural bias are coming to the Council in an ever increasing stream from the Universities, but that is not so on the animal husbandry side". This does not come to us as a surprise. When our Veterinary experts in India feel shy of the Universities and do not like to have closer relationship with these learned bodies we cannot expect a different state of affairs. We have been crying hard that the Veterinary Colleges should be affiliated to the Universities and a closer relationship between them and Veterinary Science should be established. Veterinary Surgeons should seize and welcome every opportunity of associating themselves with the educated people and learned bodies, who have been at present controlling the affairs of the Universities. To day the greatest foe for the Veterinary Science is the colossal ignorance of our educated people regarding the possibilities, utility and importance of Veterinary Science in this agricultural country. When we dispel this ignorance through propaganda and other means, we shall achieve success.

* * *

Precious good time is being wasted without taking vigorous steps to induce the Indian Universities to create a Faculty of Veterinary Science. The heads of Agricultural Departments foresaw the advantages in the affiliation and closer relationship between the Agricultural Science and Universities, and now for some time past, the Agricultural Science has formed part of the University Education, with the result, we find to-day "the Universities are coming forward in an ever increasing stream with schemes of research with an Agricultural bias, but not so in the case of Veterinary research".

We are not quite convinced of the reasons such as "long periods of time" "heavy capital expenditure" and "in only certain lines of veterinary research the Universities could successfully undertake and not in others" Everybody knows that the Research workers are at their work in several Universities tackling some important problems for years together involving heavy expenditure, long periods of time, etc. Universities have been supporting these researches in the field of physical and other sciences. Only when they are convinced by our experts that similar treatment is necessary for the Veterinary Science at the hands of Universities, then only these bodies will come forward with such schemes for veterinary research. We as a profession should therefore wake up.

* * *

The leading local Anglo Indian daily **"The Madras Mail"** has published in its issue of the 13th April 1933, a forecast for the Tamil New Year "Srimukha" by "T. M. S", one of its Correspondents, whose reading of the planets have been published in it every Tamil New Year day for the last 40 years. The following are some of the extracts from the above forecast so far as they relate to agriculture and cattle:—"**The influence of the Tamil New Year will be paramount only in the regions south of the Vindhya mountains**". Soils will be fertile, cattle will prosper, **fruits and vegetables will grow in profusion and farming will be profitable**".

* * *

We only wish that this forecast **will come to pass during the year and save the agriculturist from the prevailing depression**..... "The Jupiter on whose day the Tamil New Year has dawned, has become the premier. He is a friend of the poor farmer. He will give timely rains. Cultivation of all kinds will engage his earnest attention. *Veterinary Science will advance. Local Boards will be forced to provide more veterinary facilities, on pain of grants being withheld.* Local bodies will be made more active. Ministers will be required to work in closer co-operation with the people". (Italics are ours). We like this rosy picture of the forecast. We have pleaded in these columns all these years that the Local bodies should utilise the services of Veterinary Surgeons in the several phases of their activities. We the human agency have so far failed in our attempts. We hope the heavenly agency of Jupiter will succeed.

* * * * * *

"Responsible executive powers have not been assigned to Saturn but he is in charge of Zoology, Botany, Exchange, Colonization and Diplomatic missions. Dogs, Cows, Horses and cattle farms will also be under his control". The great hopes evoked in the above extract

are partly taken away by the prophesied control by Saturn who is not invested with responsible powers. We were under the delusion that in the heavenly hierarchy, there were no ministers in charge of portfolios, without possessing the necessary powers and without being responsible. To our regret Saturn has been placed in charge of Dogs, Cows, Horses and cattle farms without powers and responsibilities. We hope there will be a timely protest even in the heavenly assemblies against such irresponsible state of affairs, even as we find protests though without any beneficial results—in our Legislatures against similar state of affairs. The *pundits* of the constitutional laws are telling us that the Dyarchy in this country has no parallel in any country in this world. But here is a parallel in the constitution of heavenly bodies. Probably these heavenly bodies have found it easy and profitable to copy the models from Indian constitution.

* * *

Anyhow we watch with interest the events of the year, praying all the while the rosy side of the forecast may come to pass.

* * *

From the extracts of the proceedings of the Budget Session of the Madras Legislative Council on the 25th March 1933, published elsewhere in this issue, it is seen that a large number of members are continuing to take interest in Veterinary matters. This is really a hopeful sign of the times. Many of the subjects which have been engaging the attention of the A.I.V.A., and this *Journal* are touched in the discussion of the cut motion to the veterinary demand. What is now required is the continued agitation by the M.L.C's to get the several schemes proposed by them, introduced to the best advantage of the ryot. Groups of these M.L.C's will do well to get themselves well acquainted with the details of a set of veterinary problems and specialise themselves with up-to-date conditions of those problems in other civilised parts of the world, with a view to bring pressure on the authorities to introduce similar things in this country. The members of the professsion should also continue to educate the public leaders on the several veterinary needs of the country.

* * * *

We are glad to understand that the Pasteur Institute, Coonoor, has found it possible to reduce the cost of Anti Rabic Vaccine supplied for the treatment of animals, the reduced cost ranging from Rs. 6 for dogs and cats and other small animals to Rs. 31 for elephants. Regarding cattle, the reduced cost of Rs. 11 is, in our opinion, still high as the owners of these animals are generally poor. We hope time will soon come when the Anti Rabic Treatment for poor man's animals will be made available free of cost as in the case of poor man himself.

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Association News.

ASSAM VETERINARY ASSOCIATION.

ADDRESS PRESENTED TO

WILLIAM HARRIS, Esq, V. D., M. R. C. V. S., I. V. S.,
Superintendent, Civil Veterinary Department, Assam.

SIR,

It is with deep feelings of sorrow and heavy heart, we the members of the Civil Veterinary Department, Assam, beg most respectfully and humbly to approach you on the eve of your retirement and departure to England. Sir, your undaunted energy and indefatigable labour for the advancement of the Veterinary Science are quite unique. The present day well organised Civil Veterinary Department of Assam is the fruit of your labour and imaginative power. You gave it a start, tenderly nursed it in its cradle and carefully steered it through the rough sea in its adolescence so that the Department of the day is of the greatest public utility in this agricultural province of India. The well equipped Veterinary Museum, the much useful Laboratory and the Veterinary Institutions of the province will live long to fill the pages of history of the Civil Veterinary Department, Assam. Nothing could be a better and a more fitting gift by you, Dear Sir, to perpetuate your memory in this province.

Sir, you were not only our office-master but had been our guide and teacher. You impressed on us the value of self control, self reliance, self respect and dignity of labour not by mere examples but also by the moral force of your strong personality. Your name will ever shine and occupy the forefront in the history of the veterinary world in India.

Now Sir, wherever you may be, our grateful hearts will always keep close to you.

May you have a safe voyage to and a cheerful stay at home to enjoy your well-earned retirement. May God grant you a happy and prosperous long life. May the Giver of all good shower on you His choicest blessings.

We beg to remain.
Sir
Yours ever sincerely,

GAUHATI.
Dated, the 16th January, 1933.

Members of the Civil Veterinary Department, Assam.

BOMBAY VETERINARY MEDICAL ASSOCIATION.

MEMORIAL TO GOVERNMENT.

King's Building,
Soparibaug Road, Parel, Bombay
January 23rd 1933.

From

KHAN SAHEB N. D. DHAKMARVALA, G. B. V. C.
President, Bombay Veterinary Medical Association,
BOMBAY

To

The Secretary to Government,
Revenue Department, BOMBAY.

Subject:—Re-organisation Committee's recommendation for the abolition of the Bomby Veterinary College:—PROTEST AGAINST.

Sir,

With reference to my letter addressed to the Secretary, Re-organisation Committee dated 20th September 1932, and his reply thereto (copies attached), I have the honour again to address Government on behalf of the Bombay Veterinary Medical Association in connection with the recommendations made by the Re-organisation Committee with regard to the Bombay Veterinary College and the Civil Veterinary Department.

2. My Committee finds that the object of the Re-organisation Committee was to find out means of curtailing the expenditure of Government and thus balance the budget. With this object in view, the Re-organisation Committee suggested that the College should be closed on the grounds that (a) there was not enough demand for highly qualified veterinary surgeons for their supply and in order to fill this institution, students were being turned out far in excess of the demand for them, (b) that the tax-payer did not get any adequate return for his money spent on higher and vocational education.

3. With regard to above, my Committee is of opinion that if Government had made better attempts to expand the Civil Veterinary Department in the interest of the Agriculturists by introducing the latest measures in suppressing contagious diseases like Rinderpest, which carries away the bulk of the cattle population thus causing a serious economic loss to the cultivators, the interest of the

agriculturists would have been better served than at present. The problem has already been tackled or is being tackled in other Provinces and they are far ahead of this province in this respect and it is on this account that there is not much demand for veterinary services in this Province as in other Provinces. The agriculturists are ignorant and incapable of voicing their grievances and their interests have thus been neglected. Indeed it was the parental duty of Government to inculcate into the minds of the ignorant cultivators the necessity of veterinary aid and education, and thus derive the adequate return of their money.

4. The Royal Commission on Agriculture recommended that there should be at least one veterinary surgeon for every 25,000 head of cattle and one officer for each district to meet the minimum requirements of the tax-payers—the present strength has been considered by them to be quite inadequate. Notwithstanding these recommendations, the Re-organisation committee recommends the abolition of the College and reduction in the number of veterinary dispensaries which is obviously a retrograde step affecting the interests of the tax payers.

5. The Re-organisation Committee have recommended the continuation of the Laboratory attached to the Bombay Veterinary College by transferring it to Poona which will cost Rs. 16,000 for its upkeep and maintenance there. They have also recommended that 7 students should be deputed to the Madras Veterinary College by awarding them scholarships at a total cost of Rs. 14,000 per annum. In para 264 of their recommendations it is mentioned that the total expenditure involved in the arrangement which the Committee propose, is Rs. 30,000 as compared with the expenditure of Rs. 61,000 at present incurred on the College, a saving of Rs. 31,000.

6. My Committee believes that a considerable amount of deficit can be made up and the College continued to run more economically if the following suggestions be considered.

(*a*) According to certain arrangements existing between the Government and the Trustee of the Bai Sakarbai Dinshaw Petit Hospital, the staff and the students of the Veterinary College render free veterinary aid to the Hospital in return for the clinical facilities afforded to students but if the College is to be closed the Hospital authorities will have to entertain a large staff of veterinary surgeons tot reat the patients in the Hospital. The Hospital authorities will in a way be prepared to contribute towards the maintenance of the College.

(*b*) The Western India Turf Club who contribute handsomely towards several charitable institutions can also be approached to contribute a handsome donation towards the maintenance of the College and since they contemplate to encourage the Indian Breeding operations there will naturally be greater demand for veterinary surgeons in the way of their activities.

(*c*) The Bombay Municipality which was once contributing Rs. 2,500 per annum may be asked to contribute some amount towards this institution since they are making large amount of income out of the wheel tax and licensing of milk cattle stables.

(*d*) The fees for students coming from other Provinces and native states should be raised.

(*e*) As the salary of the College Officers forms the main item of expenditure in the College budget, the revised scale of pay recommended by the Re-organisation Committee should be applied (vide para. 475 of their Report) and all officers should be placed on the new scales of pay.

My committee is of opinion that it is imperative on the part of Government to continue to maintain an Institution which unlike the Arts Colleges is the only institution of its kind in the Presidency and it being also one of the nation building institutions, cannot be expected to run on commercial basis. The institution is now in existence for the last 47 years and has turned out not less than 700 Graduate-who have rendered valuable veterinary aid to the poor agriculturists. It cannot therefore be classed as luxury.

7. In conclusion, my Committee beg to enter their strong but respectful protest against the Re-organisation Committee's recommendations for the abolition of the College and reduction of certain number of posts in the Civil Veterinary Department, and they trust that the Government of Bombay will not accept them.

I have the honour to be,
Sir,
Your most obedient Servant.
N. D. DHAKMARVALA,
President,
Bombay Veterinary Medical Association.

TRUE COPY.

King's Building, Soparibaug Road,
Parel, Bombay 28th September 1932.

From

KHAN SAHIB N. D. DHAKMARVALA, G. B. V. C.
The President, Bombay Veterinary Medical Association.

To

E. W. PERRY ESQUIRE, I. C. S.
The Secretary, Re-organisation Committee, POONA.

Subject :—Re-organisation of Veterinary Service.

Sir,

I have the honour to state that I have been desired by the managing committee of the Bombay Veterinary Medical Association, the members of which include officers of the Civil Veterinary Departs ment, College officers, private practitioners and veterinary surgeons of private bodies as Municipality, S.P.C.A., Pinjrapoles etc. etc., to bring to the notice of the Re-organisation Committee now sitting at Poona, that the re-organisation and retrenchment effected from 1—4—1932 have already adversely affected the interests and prospects of the employees of the department. Besides the closure of the number of district veterinary dispensaries has deprived the agriculturists of the benefits of veterinary aid.

Although the Association is late in bringing this matter to the notice of your committee, I may point out that any further retrenchment either in the department or the college will seriously affect the utility and development of this department to the agriculturists and Science

I hope that I may be allowed to point out for the information of your committee that in other provinces as Madras, Central Provinces, The Punjab etc., the veterinary profession has advanced considerably and been greatly encouraged.

In conclusion, the Association ferverently hopes that due consideration will be given to this representation for which the Association will feel grateful.

I have the honour to be,
Sir,
Your most obedient Servant,
(*Sd.*) N. D. DHAKMARVALA,
President,
Bombay Veterinary Medical Association.

RE-ORGANIZATION COMMITTEE, POONA.

Dated 29th September, 1932.

Dear Sir,

I write to acknowledge the receipt of your letter dated the 28th instant on the subject of the Veterinary Service and to state that your suggestions have been placed before the Re-organisation Committee.

Yours faithfully,
(*Sd.*) E. PEERY,
Secretary,
Re-organisation Committee.

To

KHAN SAHIB N. D. DHAKMARVALA,
President, Bombay Veterinary Medical Association.

REPORT OF THE ANNUAL GENERAL MEETING OF THE BOMBAY VETERINARY MEDICAL ASSOCIATION.

The Annual general meeting of the Bombay Veterinary Association was held at the Gokhale Education Society's Hall, Parel on Saturday the 24th December 1932 at 3 p.m.

The following members were present :—

Khan Sahib N. D. Dhakmarvala,	Mr. M. R. Tegare,
Mr. Y. N. Marathe,	„ M. K. Garudacharya,
„ D. S. Laud,	„ V. W. Nabar,
„ M. G. Kulkarni,	„ A. H. Khan,
„ A. G. Khair,	„ S. J. Khambete,
„ J. G. Gokhale,	„ R. G. Sathe,
„ G. T. Shah,	„ N. S. Naik,
„ P. B. Cardmaster,	„ G. S. Patankar,
„ V. B. Desai,	„ G. K. Khajgivala,
„ R. L. Jaigaonkar,	„ P. G. Date,

The annual report of the Managing Committee was submitted by the President.

The President referred to schemes for the advancement of horse and cattle breeding and milk problem of the city of Bombay. He referred also to the apathy of the members in not sending more professional papers and lack of interest, and also how the Veterinary Surgeon will be useful to the public in his professional capacity. He

congratulated Mr. Y. N. Marathe, the Honorary Treasurer of the Association for his scheme of the improvement of milk cattle breed in Poona City and starting a club by name "Gopal Sangha". The report stated that there were 133 members at the beginning of the year and there were 126 members at the end of the year. Thus there was a decrease of 7. During the year under review the total income was Rs. 345-13-7 as against Rs. 451-8-10 of the last year, which added to the balance of the last year *viz.*, 1071-10-7 amounted to Rs. 1417-8-2. The expenditure was Rs. 329-12-0 as against Rs. 403-0-0 of the last year. Thus the balance is Rs. 1087-12-2 only. The President appealed again to all members to help us by asking their professional brothers to join the Association by explaining to those who have never given a thought, that it is of great advantage to spend a nominal sum of Rs. 2/- per year in support of an Association which devotes its time to working for the interest of members as a whole.

After reading his report and address the President requested the members to offer remarks.

The following interesting and instructive papers were read by the following members :--

(1) Inflammatory Granuloma of the tongue of a Black Leopard (Felis Pardus Var Niger) by Mr. D. S. Laud, G.B.V.C., F.Z.S., Superintendent, Municipal Gardens, Byculla,

(2) 'Egg-bound' in a caged Zanzibar grey parrot by Mr. K. R. S. Ayer, G.B.V.C.

(3) Streptococcus Subacidus infection in a Race Horse by Mr. K. R. S. Ayer, G.B.V.C.

Lively and interesting discussion took place on the papers read. Mr. P. C. Bapat, Veterinary Assistant Surgeon. Chiplun, had forwarded a sample of soap, which had the power to eradicate ticks from all animals, to be exhibited at the meeting.

The sub-Committee's report, regarding Registration of the Association was considered and the following resolution was passed :—

Resolved that Secretaries of similar other Professional Associations be consulted and also a firm of Solicitors for legal opinion with regard to the registration and its advantages.

Proposed by Mr. Y. N. Marathe.

Seconded by Mr. A. H. Khan.

Resolved that the following members should be the office-bearers for the year 1933 :—

Khan Sahib N. D. Dhakmarvala, **President.**

Mr. P. G. Date and Mr. M. G. Kulkarni, **Jt. Hon. Secretaries.**

Mr. Y. N. Marathe, **Hon. Treasurer.**

Mr. K. R. S. Ayer,
Mr. J. G. Gokhale,
Mr. G. K. Khajgivale,
Mr. D. S. Laud,
Mr. R. G. Sathe.
} **Members of the Managing Committee.**

M. K. Garudacharya, and Mr. A. G. Khair, **Auditors,**

Resolved that a sum of Rs. 10. only be paid to the Gokhale Education Society as donation.

Resolved that the Principal of the Gokhale Education Society's High School, Parel, be thanked for allowing us the use of the Hall for the Conference. Resolved that the rules as amended be printed and distributed to all the members.

Resolved that a vote of thanks be passed for the retiring Managing Committee.

A vote of thanks to the President terminated the meeting.

PRESIDENTIAL ADDRESS.

BY

KHAN SAHIB N. D. DHAKMARVALA, G. B. V. C.

At the Annual General Meeting held at the Gokhale Education Society's Hall, Parel, on 24th December 1932.

GENTLEMEN,

On behalf of the members of the Managing Committee of the Bombay Veterinary Medical Association, it is my pleasant duty to submit to you for adoption the Annual Report for the year ending 31st May 1932, together with the audited statement of accounts.

In the first place, allow me to thank you sincerely for the honour you have done me by electing me again as your President.

In the second place, I accord a very hearty welcome to you all and thank you for your attendance and co-operation towards the success of this Annual function.

Gentlemen, in the same way as the whole Presidency is suffering from financial stringency owing to trade depression, it may be said that our Association is not free from its effects. Because you will notice that the membership on the roll at the close of the year has been reduced from 133 to 126. Besides this, the apathy of the members continues with regard to the regular payments of the annual subscriptions and contribution of Professional Papers and clinical notes on interesting cases is very meagre. I therefore appeal again to all members to help us by asking their professional brothers to join the Association. Those of you who appreciate the value of supporting an Association which represents your interests can certainly help us to get new members by explaining to those who have never given a thought, that it is of great advantage to spend a nominal sum of Rs. 2 per year in support of an Association which devotes its time, to working for the interest of members as a whole. Your Committee are most anxious to increase the scope of its work but this cannot be done until our membership goes on increasing and the more members we have the more we will have to do for them. Besides the financial stringency mentioned above, the decrease in membership may be also due to the new Service Associations started last year in the Presidency proper and in Sind. I am sure that these new Associations are not started in any spirit of counterblast or competition with our Association. We will be willing to co-operate with them as our working is to achieve similar aims and objects.

Gentlemen, on the subject of financial condition of our Association, you will notice from our income and expenditure statement that during the year under review our income was Rs. 345-13-7 as against Rs. 451-8-10 of last year, which added to the balance of last year *viz.* Rs. 1,071-10-7 amounted to Rs. 1,417-8-2, The expenditure was Rs. 329-12-0 as against Rs. 403 of the last year. Thus the balanee is Rs. 1,087-12-2.

During the year one meeting of the Managing Committee was held and it was resolved to forward a strong representation to the Reorganisation Committee appointed by Government requesting them not to make any further retrenchment either in the cadre of the service or the College staff and the Civil Veterinary Department as it will seriously affect the utility and development of this Department, the Agriculturist and the Science. Also it was resolved that Mr. M. F. Vakharia be communicated with for the transfer of the funds of the old Association to the present one on the conditions laid down by him and a letter accepting all the conditions and signed by the present members of the Managing Committee was forwarded to him. Also the Sub-committee appointed by the General Body at their

meeting held on 26th December 1931 for submitting their report regarding the registration of the Association under the Indian Company's Act was given further time to submit the Report.

Gentlemen, we are aware that owing to a mechanical age, the equine practice has suffered much but we also know that the horse has not yet lost its usefulness. The decision of the Stewards of the Western India Turf Club to increase the stakes allotted to races for Indian bred horses is a step in the right direction towards helping horse breeding industry, which at present is not in a flourishing condition. If the other Turf Clubs can be persuaded to do the same thing, a big step forward will have been taken. With stakes worthwhile, breeders will have an inducement to import the best English and Australian stallions and mares and the quality of the Indian bred horses must improve. In this connection, I may mention that with a view to encourage horse breeding in India, the National Horse-breeding and Show Society of India is also trying its best to impress upon the public that the future of the Indian thorough bred horse will be largely in the hands of the racing clubs of India. How far the Turf Clubs realise this can be gauged from the fact that of Rs. 45 lakhs given in racing stakes in India every year, only Rs. 2 lakhs are reserved for races for Indian horses, and horses to the average total value of more than Rs. 70 lakhs annually are imported from abroad. When the National Horse Breeding Society was founded 9 years ago. only 30 Indian horses were found racing under the rules ; that number has now increased to 200, but including race horses, polo ponies, pig stickers, hacks and remounts, India is still producing far less than one quarter of her annual requirements. So far as encouragement on big scale from the Turf Clubs is concerned the problem resolves itself into a vicious circle. Breeders of Indian thorough breds cannot carry on for the mere pleasure of breeding. They must find a market for their products and a market which will make worth their while to breed Indian horses for whom there has to be a regular cycle or rotation of races in the same way as there are for English thorough breds and Arabs and that thereby owners can keep a regular racing string and go on replenishing it. To-day there is not a shadow of such a cycle for Indian horses and consequently few breeders have taken up the matter seriously. On the other hand the Turf Club Executives say that they cannot afford to set aside big stakes for Indian horses for the simple reason that there are not enough horses to compete for them, nor can the Turf Clubs believe that the provision of regular and reasonable stakes would lead to a sufficient increase in their number. The management cannot ignore the fact that it is the Arab which largely provides the sinews of war

for racing in India. The future of racing in India is unlimited and the Indian thorough bred can be developed without ousting the Arab or the imported thorough bred. As a result of the Horse Breeding Commission which visited India some 30 years ago, lands worth nearly 14 crores rupees were handed over to breeders on condition that they kept one brood mare for the purpose of breeding Indian horses for the Army. To-day the return of this land is small and the scheme is producing less than a quarter of her requirements as stated above. The Horse-breeding Commission looked on the breeding of horses only to provide Remounts for the Army and not to establish a national industry. The primary aim of the National Horse Breeding and Show Society of India is to set this national industry on its feet by founding a race of Indian thorough bred and establishing India's own stallion power.

Besides this, it is gratifying to note that Government which had appointed a Committee to report on the question of cattle supply and its improvement in Sind in 1928, has lately issued a communique on it. The Committee was asked (1) to examine the question of the sufficiency of cattle in Sind with special reference to the changes in cultivation as a result of the construction of the Lloyd Barrage, (2) to consider the measures necessary to increase their number and to improve the quality, and (3) to make any other suggestions relevant to the subject. The Committee smbmitted their report to the Government last year and a Press Note embodying the principal recommendations of the Committee was issued in December 1931. The Government has now passed orders on the report which has been published in a resolution in October 1932. The Government agree with the Committee's view that it will be a value to them to obtain correct figures of agricultural live-stock by means of special establishment in one or two typical talukas and are prepared to give effect to the recommendation when funds permit. The Committee recommended that a number of small established breeders should be granted small holdings since they are likely to be crowded out as their present grazing lands are brought under cultivation. The Government consider that the object aimed at, will be better achieved if Co-operative Cattle Breeding Societies are formed in convenient centres with the assistance of the Deputy Registrar of Cooperative Societies and small holdings allowed in a compact area so that the formation of cattle breeding societies can be readily organised and their working supervised and assisted. Experiments on these lines should be made as far as staff and funds at the present time permit. The Committee propose to develop some well established breeds of Sind cattle for milch and draught purposes and suggest that the cattle farms should be

established. The schemes appear to be sound but can only be taken up gradually as finances permit. The Government also accept the Committee's recommendation that Sind should obtain a more adequate share of the grants already available for the premium bull item and that efforts should be made to encourage that system, which in their opinion, is an important line of advance. They have under their consideration the revision of the premium bull rules with a view to making the system more extensive in its scope by offering contributions towards the cost price of a bull or a monthly premium and by granting facilities for loans under the Agriculturist's Loan Act to breeders who combine cattle breeding with agriculture. The Committee recommended that the Civil Veterinary Department in Sind should be expanded and that the present system of dual control by the Department and the Local Boards be abolished. The Government are, under the present financial conditions unable to accept the additional liability. In the opinion of Government, grazing on unoccupied lands in the Barrage should be free and uncontrolled, no fees being levied and no permit being required. In this connection, it is also a matter of gratification to note that in the Presidency proper, the opening ceremony of the "Gilligan Cattle Breeding Farm at the village of Pimple about 9 miles away from Jalgaon was performed in October last by the Minister of Agriculture. This cattle breeding farm which was started about 7 months ago is being conducted by the Taluka Development Agricultural Cooperative Association, Jalgaon and is the only one of its kind in the Bombay Presidency to be run by a private agency, The scheme consists of importing good Nemari bulls and cows for cattle breeding purposes in this District and to supply premium bulls to every village in the Taluka and thus save the annual drain of two lakhs of rupees which are sent out from Jalgaon Taluka alone for buying cattle. The Farm has been named after Mr. W. B. Gilligian, the former Collector of East Khandesh, who had helped greatly in starting the cattle breeding farm. The Association had imported 22 cows and 2 bulls about 7 months back from Nemad. A forest area of 200 acres is secured by the Association where all these cattle are maintained. Nemari cattle were extensively used for all agricultural work throughout Khandesh as they have been found most suitable. The aim of the Farm was to breed bulls from the imported cattle and to supply one bull to every village in the Taluka for further breeding purposes. The scheme is costly and the Association asked for a Government subsidy of Rs. 1000 a year and five bulls every year and exemption from rent fee for the lease of the forest area. The Minister said that although the Association's three requests were quite reasonable, the Government being at present faced with a

considerable financial stringency, it was difficult for him to promise them anything. In this connection, I wish to offer my hearty congratulations to the Co-operative Association for their ambitious scheme and wish them every success. I may state that the process of deterioration in Live-stock which has been going on in India for several years can be stopped only by scientific breeding in combination with improvements in feeding cattle. Nothing is more badly needed than cooperation among the agricultural population to check the process. The work that is being done at the Gilligan Breeding Farm by the Jalgaon Taluka Agricultural Co-operative Association is, therefore, to be commended particularly because it is indicative of the success which Co-operative Societies, once they have been properly organised, are likely to achieve in this field. But the financial difficulties should not stand in the way of assistance as its success will undoubtedly promote the formation of similar Co-operative Societies in other districts and lead to an early improvement of Live-stock in the Presidency. The difficulty in the management of Live-stock lies not so much in raising good stock as in proper feeding. The cultivator should make sacrifice on behalf of his cattle. No doubt, calamities such as drought followed by fodder famine account for poor feeding sometimes, and the frequency of loss by disease tempts the cultivator to keep a larger stock than is actually necessary and thus increases his difficulties. It is by carrying on vigorous propaganda to improve these conditions that Co-operative Societies can be of valuable assistance. The Veterinary and Agricultural Departments can render their services more usefully by supplying them with information and supervising their propaganda. It is also gratifying to note that the efforts of the Bombay Presidency Live-Stock Department, and public Associations like the Bombay "Gowrakshak Mandali", the "Bombay Humanitarian League and Bombay Presidency Cattle Improvement Association have been now bearing perceptible results with regard to the work of cattle breeding in the Presidency because the cattle section of the Sholapur District Agricultural Exhibition opened last month by H. E. The Governor, bore eloquent testimony to the work of cattle improvement. It was noticed there that the breeders who brought their animals to the exhibition from different villages were careful about their newly bred animals which as they have begun to realise from propaganda and actual results, is a source of great advance to them. The breeders of the best cattle got handsome prizes. Thus the regular propaganda seems to have created a genuine interest among the cultivators and breeders in regular breeding and care of cattle stock. The Poona District Cattle Improvement Association started last year has also made a wonderful progress. In this connection, I am glad to state that our energetic Treasurer Mr. Y. N. Marathe is one of

the inspired workers of the Association and he has now started with the help of others, a "Gopal Sangh" or cow keepers, club whose patrons and life members are entitled to get a free cow which they are required to maintain and breed on proper lines through the select bulls kept by the Association. The dry cows of Gowlis are sent to the Gopal Sangh at Poona where good breeders and milkers are saved from premature death by slaughter. They are maintained by the Sangh at their expense and bred systematically. Thus the cow is saved, bred from, and milk is utilised by the members. It may also be noted that a Bombay Presidency Poultry Association has been formed in Poona. They hold their annual Poultry Shows there. They invite all lovers of Poultry and especially those interested in seeing bigger and better eggs, to join the Association. They also assist members with advice on disease of Poultry.

Gentlemen, the fourth annual conference of the Veterinary Department of Mysore State was opened in June last. It may be mentioned that Mysore was the first amongst Indian States to form an Association of Veterinarians and its work was progressing favourably. As a result many things had been gained for the Profession. The Mysore Serum Institute had developed considerably to be in a position to supply virus and serum for Rinderpest. It had also undertaken to supply Black-quarter filtrate and Hæmorrhagic Septicæmia Serum and Vaccine and sheep pox vaccine for use in the field. The goat-virus used for the protection of cattle during an outbreak of rinderpest had proved very satisfactory and the re-tests with bovine virus of the Amrit Mahal herd inoculated with goat virus has demonstrated that active immunity could be conferred by goat virus alone. This goat virus alone method if found successful ought to be utilised in all Provinces, being more convenient and economical by saving the large expenditure now incurred on serum. We will await further developments in this direction. In this connection Major R. F. Stirling, I. V. S., Director of Veterinary Services in Central Provinces has published an interesting paper on some experiments in Rinderpest vaccination, Active immunisation of Indian Plain Cattle by inoculation with goat adopted virus alone in field conditions in the "Veterinary Journal" of May 1932.

Gentlemen, I wish to refer again to a subject in which I take a great interest viz., the problem of milk supply in towns. In the last annual report, I gave rough details of the scheme of a Model Dairy Farm and appealed to some of our patriotic Graduates to give it a fair trial to make it a success. Since then a great deal of interest has been shown and a number of proposals have been put forward for improving the milk supply of Bombay. The Bombay Municipal Corporation has had under its consideration a scheme of bringing

about 10,000 lbs. of milk per day into Bombay from Gujarat by paying a subsidy of about Rs. 57,000 a year to a company. I am not in favour of this scheme. I am aware that in Gujarat thousands of lbs. of milk are available and at the same time it is cheap. But unfortunately the existing conditions are not in its favour. To get 10,000 lbs. of milk a day means that over 1000 people must handle that milk. As the production of milk in Gujarat is a home industry, each home owns from one to two buffaloes in milk, and each buffaloe yields about 10 lbs. of milk a day throughout the year. Taking that each village would supply 1000 lbs., this means 10 villages and these villages may be anything from 2 to 6 miles away from the railway. The posibilities of contamination, therefore, are great. The milk would churn in transit and milk milked in the evening at about 4 to 6 P.M., would not be distributed in Bombay until the afternoon of the following day and unless this milk be suitably treated it would not keep. The only way out of the difficulty would be the establishment of milk receiving dairies near railway stations at centres of supply. Here the milk will have to be centrifically cleaned, then homogenised to prevent rising of fat and finally pasteurized and cooled. Now all this could not be done without money and it is doubtful if larger milk consumers *i.e.*, the Indian population would use homogenized and pasteurized milk, because once the milk is homogenized, the fat will not rise and if fat does not rise in milk in India it is considered poor. I am therefore of opinion that the Farm should be located somewhere near Chimbore which is within easy reach of Bombay. Here a large plot of land should be acquired and Government should set aside for the present some acres of it for a start to be made, and should this prove successful, more could be made available. The land should have a permanent natural water supply. Municipality or some Public Body or private person can take this land and build stables and servant quarters etc., according to the scheme detailed by me in my last year's report. From Chimbore it is possible to carry into Bombay by motor vans, pure clean milk untreated which milked at 3 A. M. could be consumed by 8 A. M. the same day, while the expenses of railing it, would be no more than milk produced in Bombay. In these days of financial stringency, the Municipality instead of giving a subsidy to a company, can spend the same sum on making a start at Chimbore so that a substantial interest could be derived annually. Thus one would like to start a "Drink more milk campaign". We must take up the problem of ensuring an adequate milk diet for children to make up for the deficiency of proteids in our ordinary diet, selecting good and healthy milkers in breeding and thus prevent heavy death rate amongst children. We should also help a great deal to improve the

growth of fodders and methods of preservation and distribution. If we are to meet with full success in this kind of work it will be necessary to do a good deal of propaganda among our local consumers. At present there is not only a great deal which is wrong about our milk supply but there is something very wrong with the public also because it does not realise the value of clean milk. On these grounds, therefore, I appeal again to some of our Graduates to take up the work and I am sure the enterprise will be successful.

Gentlemen, I understand that at preseat negotiations are going on in connection with a new industry for India viz. "Frozen-milk" which has for its object the transport of milk in solid slabs like blocks of ice. This new freezing process is known as "Cito-Gel" which has for its object the preservation of various liquid food stuffs such as milk, cream and juices of fruit. A demonstration plant for the purpose has been created in the Bombay factory of the Lightfoot Refrigeration company and samples of blocks of milk were submitted to the Municipal Health Officer who has reported very favourably on it and no deterioration had been caused in the qualities of the milk. The Cito-Gel process is the invention of an Etonian Bacteriologist Dr. Boris Citovich who was associated on the Engineering side by Mr. Kusik who is now in Bombay. One of its greatest advantages is that it can easily be carried out in practice and requires a very simple apparatus in addition to the usual refrigerating plant and it is claimed that the natural qualities of the original products remain unaltered, thereby greatly improving upon the process of sterilization, drying or boiling. Above all things, speed is the essence of this process, because the low temperature employed ensures so rapid a congelation of the liquid products that the congealed articles are prevented from changing their composition or their natural qualities. The product when melted i. e. milk, regains its original form and is unchanged either chemically or physically. Further the microbes breed more slowly in de-frosted milk with the result that it keeps fresh for a much longer period, which is a decided advantage to both retailers and users. The commercial exploitation of the process in India is still under review and it is likely first to be applied to the improvement of the milk supply of the City of Bombay. This can be accomplished by installing a plant at one of the milk producing centres in Gujarat and introducing blocks of frozen milk into churns of milk before the latter are entrained to Bombay. These blocks will have a cooling effect upon the milk in the churns and will ensure that the milk is in fresh condition when it arrives at its destination. Mr. G. Azrilenks of Menkwa Chambers, Outram Road, Bombay is the local representative of the patentees. If the operating costs are kept

sufficiently low the process ought to prove a success. Besides this, mainly Municipalities in India are grappling at present with the difficult and important problem of milk supply. So the public will welcome the announcement made by the Imperial Council of Agricultural Research Advisory Board at its meeting held in July last that they have sanctioned an elaborate scheme costing a lakh of rupees to investigate all problems in connection with the industrial side of the dairying industry. The Bombay Government are willing to set aside about one thousand acres of land for a start somewhere near Palghar which is 60 miles from Bombay. Thus the solution of this problem will have a two-fold effect in that Bombay City will be relieved of its primitive methods of milk supply and Government will carry on their scheme of cattle improvement. It cannot be claimed that any scheme by itself will solve the problem, as the city consumes daily about 9000 maunds of milk, but the success of the Government scheme will open the way to the ultimate remedy of an evil which Bombay has tolerated too long.

Gentlemen, I hope you will excuse me for taking up so much of the space of the Annual Report on this subject and your valuable time to day but it is a subject of vital importance and therefore this matter can be taken in the form of a paper from me.

It is also pleasing to note that the Advisory Board of the Imperial Council of Agricultural Research have recommended the scheme for investigation into the most suitable and economic methods of combating different parasitic infection in ruminants in the field, concurrently with experiments to determine animal resistance to parasitic infection. One of our own graduates Mr. Naik has been appointed to carry on this work in the Bombay Presidency.

Gentlemen, *The Indian Veterinary Journal* has served a very useful purpose in keeping members and subscribers acquainted with what all Associations are doing. The *Journal* champions the cause of the profession. It also contains original articles, reports of interesting clinical cases, suggestive editorials, extracts from scientific periodicals etc., etc. We have to thank its Editor Mr. P. Srinivas Rao for the very efficient manner in which he is making the *Journal* very popular in India. I trust all members of the profession will become its subscribers and help the Editor by sending original articles, clinical cases, etc.

Gentlemen, before I close I desire to make a reference to the retirement of Mr. K. Hewlett from the Principalship of the Bombay Veterinary College after a service of nearly 22 years, and to pay a special tribute to his work. All those who have worked with him or under him are aware of his valuable services and activities in the

Department and the College owes him very much for his devoted service and his colleagues will miss his valuable advice. I trust that although he has left India, the College will retain its place in his thoughts and affections. He has been succeeded by Mr. V. R. Phadke who was a member of our Managing Committee for many years. We offer him our hearty congratulations on his appointment as the first Indian to the Principalship of a college. We trust that he will be able to do some more useful work and try to advance the interest of the Profession.

Before closing the report, I have to thank all of you again for your presence and co-operation in making this annual function a success. Some of you have come from long distances to take part in it and discuss problems of professional interest and to exchange notes and thus to equip ourselves to render efficient service to the profession. An annual gathering of this kind is not only of great educative value in that it brings before you the accumulated results of experience, and studies of the various members of the profession but it also adds to the *esprit de corps* of the service.

Gentlemen, I am glad to have this opportunity again of voicing the gratitude felt by the members of the Association to the members of the Managing Committee and particularly the Secretaries Messrs. Date and Garudachar and the Treasurer Mr. Marathe, for all they have done during the year-when we look at the various sides of the work, it is not to be wondered at that we have been able to draw upon such voluntary workers.

With these remarks, it is my pleasant duty, to move that the Managing Committee's Report and Statement of Accounts for the year ending 31st May, 1932, be adopted.

PROCEEDINGS OF THE MEETING OF MEMBERS OF THE VETERINARY PROFESSION, HELD AT 6 P. M., ON SUNDAY THE 16TH APRIL, 1933, IN MADRAS.

Present:—

	Messrs.		Messrs.
1.	A. K. Mitra,	7.	G. Theophilus,
2.	M. Sunderanathan,	8.	D. Antonisawmi,
3.	P. Srinivasa Rao,	9.	A. R. Mathusuthanan,
4.	M. S. Sastry,	10.	L. Adinarayana Sarma,
5.	M. P. Kanniah Naidu,	11.	S. Vancheswara Iyer,
6.	J. D. David,	12.	L S. Parameswara Iyer,

13. T. Vinayaka Mudaliar,
14. R. Venkataraman,
15. A. Krishnaswami,
16. A. Venkoba Rao,
17. V. Janakiraman,
18. S. Vaidynatha Mudaliar,
19. T. Raghavan,
20. P. A. Parthasarathy and
21. K. Mukunda Rao.

Proposed by Mr. V. Janakiraman, seconded by Mr. T. Vinayaka Mudaliar, Mr. M. S. Sastry was unanimously elected to be the Chairman of the meeting.

The Chairman explained the object of the meeting and said "there is a strong desire among all the ranks of the profession in this presidency to put up in the Madras Veterinary College, a portrait of Mr. F. Ware, F. R. C. V. S., I. V. S., Director of the Imperial Institute of Veterinary Reasearch, Muktesar, who has rendered very valuable services to the profession in this presidency, where he presided over the destinies of the Veterinary Department for nearly two decades."

Resolution :—*That in appreciation of the valuable services rendered by Mr. F. Ware, F.R.C.V.S., I.V.S., Director of the Imperial Institute of Veterinary Research, Muktesar, to the profession during his long stay in this presidency as the head of the Veterinary Department, the members assembled here this evening request the Principal of the Madras Veterinary College to kindly convene a meeting and take necessary steps at an early date to put up a portrait of Mr. F. Ware in the College.*

Moved from the Chair and carried unanimously.

With a vote of thanks to the Chair, the meeting terminated.

M. S. SASTRY, G.B.V.C.,
Chairman.

College News

MADRAS VETERINARY COLLEGE.

List of candidates who graduated this year, arranged in the order of merit in March, 1933.

1. Hanumantha Rao M.
2. Govinda Rao K.
3. Srinivasan V.
4. Jambulingam A. M.
5. Venkatakrishna Rao M.
6. Srinivasarangan R.
7. Abdul Kareem Khan.
8. John A.
9. Venkataramiah S. G.
10. Herbert G.
11. Abdul Haffies D,
12. Venkatanarasu G.
13. Appalacharlu V. V.
14. Prabhakaran T. N.
15. Gopalan S.
16. Dasaratha Ramiah V.
17. Appiah M.
18. Satti Rami Reddy.
19. Subba Rao N. V.
20. Thandavarayan M.
21. Balagurunathan G. B.
22. Ramaswami L. P.

MADRAS, 31-3-33. | T. J. HURLEY, M.R.C.V.S., D.V.S.M., I.V.S.. *Principal, Madras Veterinary College.*

BENGAL VETERINARY COLLEGE.

The undermentioned candidates have passed in the order of merit in the Diploma Examination of the Bengal Veterinary College for the session 1932-33.

1. Y. H. Surrah
2. S. M. Khayat
3. H. R. Malhotra
4. M. Y. Muallem
5. K. L. Ganguly
6. W. R. Bashoo
7. T. K. Panikkar
8. S. R. Nandy
9. H. S. Ramaswami
10. K. S. Rathore
11. C. E. Lewis
12. Md. S. A. Khan
13. N. N. Sharma
14. K. V. N. Rao
15. H. L. Thomas
16. M. L. Chowdhury
17. B. R. Paul
18. B. Chowdhury
19. T. R. Pellay
20. B. N. Chatterjee
21. P. N. Roy Chowdhury
22. M. L. Verma

BELGACHIA, The 27th March, 1933. | A. D. MacGregor, I. V. S., *Principal, Bengal Veterinary College.*

BENGAL VETERINARY COLLEGE

Annual Diploma and Prize Distribution Ceremony

REPORTED BY MR. G. S. BANERJEE, G.B.V.C.,
House Surgeon Dog-Ward, Bengal Veterinary College, Calcutta.

The annual function of distributing diplomas and prizes was held on 27th March 1933, under the presidency of Mr. A. R. Mellis, Member of the Advisory Committee, who delivered an interesting and inspiring address, extract from which we give below :—

"I feel sure you will all agree that the Report of Progress of work done during the past session to which we have all just listened, is most gratifying and commendable not only to the students themselves, their Principal and staff, but to all of us who are keen on animal welfare, and also, most important of all, to the people of this Province.

It must be patent to all in these days that the economic value of Veterinary Education to an agricultural province like Bengal is stupendous, and it would appear that where animal welfare and animal husbandry are the foundation stones of all agricultural progress in a country the dissemination of at least the rudiments of veterinary knowledge to all and sundry seems essential. That a more advanced training, such as is done here, of greater and greater numbers of workers with leanings in this direction, is one of the outstanding policies of this Government, is most encouraging. For in such an immense agricultural area as Bengal, with millions of working and milch cattle (24, 724, 234) and innumerable disease problems to solve, (Rinderpest, Hæmorrhagic Septicæmia, Foot and Mouth Disease, Parasites, etc.) one cannot but feel at times that the enormity of the problem facing the veterinary profession and this College in particular, is almost beyond solution. It is however, only by hard and continuous labour that most of the difficulties of life are overcome and as has just been so ably explained to us in the Report of this College, by dint of sustained effort on the part of its Principal and Staff success has this year again been met with in the high percentage of passes. One might feel assured that in addition to the sum of technical knowledge now possessed by those of you students who have so creditably acquired the diploma, you will also retain and amplify your love of animals and of your fellow men, and that you will not imagine you have learned all there is to learn of this vast science :—one would sincerely hope you will, all of you, continue your studies both practically and theoretically, and reap in the future further success in that filed of science, which you are now entering in real earnest. And since I have referred to the benefits

accruing to a Province from the education of those who live in it, I cannot too strongly urge the youths of this Province to turn their thoughts, studies and energies towards subjects of a veterinary or agricultural nature, such as poultry farming and fruit growing, thus escape the evils and pitfalls which follow upon idleness and lack of occupation.

As far as I can gather as a Member of the Advisory Committee of this College, the strength of Veterinary Surgeons in the districts and sub-divisions of Bengal, is far below requirements and they, therefore, cannot compete with the ravages of cattle disease, etc., as thoroughly as ought to be done; on an average, one veterinary sur geon has to attend to one and a half lacs of cattle over an area of 700 squire miles. It is to be hoped that the District, Local and Union Boards will in time, in co-operation with the Government, increase these numbers, so that there may be in each thana at least one Veterinary Assistant Surgeon with a modest dispensary. This, I am given to understand, would be nearly ideal.

In this connection, the Veterinary Assistant Surgeons of this province are under a deep debt of gratitude to the Principal whose propaganda in various ways has resulted in large number of them in obtaining employments.

Other directions in which too your Principal's activities have gone far towards solving the problems of this province, are the extension lectures on poultry farming, dairying and fodder crop growing, which have recently been included in the College Curriculum.

Further extensions in each section of the College seem called for, particularly in the form of additional lectures in the Pathological Laboratory, but all such changes will appear, I understand, in the revised curriculm, which is now in the making.

The proposed post-graduate course should also prove a great help towards improving standards all round and will, I hope, materialise before long.

But, ladies and gentlemen, there can be very few of us here to-day who are unable to appreciate the difficulties under which most Government and Commercial bodies are labouring from shortage of funds. It therefore stands to the greater credit of all concerned here, that they have been able to carry on to such a successful issue and in so many directions the work of this College under straitened financial circumstances, for, as the Principal has just hinted, econmy has been the watchword of the year.

In the general administration of this College plus the extra routine activities, many economies have been effected and sources of Revenue provided during the year. I should like also to draw special

attention to the facility of this College Riding School recently extended to the public. The fees are very moderate indeed and in urging all and sundry to take advantage of this opportunity to learn to ride, I can with confidence assure them that they will be contributing to the welfare of a most deserving public institution with much gain in health and pleasure to themselves.

That the inefficiency in the training, teaching and general organisation has not followed in the faltering footsteps of finance is most satisfying, and it is obvious that the Government appreciates fully the necessity and economic value of giving to the youths of this province training and experience in subjects such as are taught here."

After a vote of thanks to the Chair proposed by Rai Bahadur A. C. Banerjee M.A., C.I.E., the function terminated late in the night. Rai Bahadur also delivered a nice neat little speech in which paying a great tribute to the Principal he said " Bengal is very lucky that they could get the service of Mr. MacGregor, a high souled, noble minded and a generous renowned man as a Principal of the College who has done much for the emancipation of the Veterinary Education in Bengal and thereby solving the question of unemployment. It is due to his indefatigable energy and a wonderful organising capacity this College boasts to be one of the best Veterinary Institutions of cosmopolitan nature in Asia ".

BOMBAY VETERINARY COLLEGE.

The following candidates have been declared successful at the Professional Examination held in April 1933, in order of merit, in the final year.

1. Singh S. S.
2. Iyengar K. N. G.
3. Abhyankar R. K.
4. Kulkarni H. V.
5. Noor Ahmad
6. Ghose S. C.
7. Choubey S. L.
8. Murthy K. S.
9. Wallabhdass P. R.
10. Swamy B. N.
11. Pillay M. K. P.
12. Verma J. P.
13. Nemade G. G.
14. Bhonsle M. G.
15. Iyengar S. N. V.
16. Sarnobat R. D.
17. Dube R.
18. Navangul V. N.
19. Pathak P. R.
20. Deshpande B. C.
21. Rayalkar G. K.
22. Sayeed M. A.
23. Marathe K. D.
24. Lawrence E. G.
25. Bhonsale S. S.
26. Abbasi A. M.
27. Kulkarni N. G.
28. Deshmukh K. V.

Parel.
21—4—1933.

V. R. PHADKE,
Principal, Bombay Veterinary College.

BIHAR AND ORISSA VETERINARY COLLEGE, PATNA.

NOTICE.

The next session of the Bihar and Orissa Veterinary College will commence from the 1st July, 1933.

1. Candidates desiring admission should each submit his application on the prescribed form, together with the following certificates in original, so as to reach the Principal on or before the 1st June, 1933.

(*a*) Age and moral character certificate from the Headmaster of the school at which he last read.

(*b*) University certificate or a certificate from the School or University authorities to show that he has passed the Matriculation Examination.

(*c*) Medical certificate of fitness from an Assistant Surgeon.

(*d*) Letter from his guardian stating that all expenses incurred by his ward during the latter's period of study at the college will be paid.

(*e*) Letter of identification from some well known person stating that the candidate is known to him and the statements made in the application form are correct.

2. Government or District Board stipendiaries should in addition to the above each produce a letter from the Director of Veterinary Services, Bihar and Orissa or from the Chairman, District Board concerned, to whom they should apply in the first instance, stating that their selection as stipendiaries has been approved.

3. Preference will be given to candidates who have passed the I. A. or I. Sc. Examination of a recognised University. A good knowledge of English is essential.

4. Non-stipendiary candidates will have to appear before the Governing Body of the College when called for interview.

5. Fees must be paid according to the scale under rule 8 of the college rules, in advance, the initial payment due at the time of admission being Rs. 35-8-0 only.

6. Candidates will reside in the college hostel from the date of their admission unless specially exempted.

7. The scale of pay of the Bihar and Orissa Veterinary Service is as follows:—

Provincial ... ... Rs. 250-20-750

Subordinate—(*a*) Veterinary Inspectors.

1st grade. Rs. 200
2nd grade. Rs. 160
3rd grade. Rs. 130

(*b*) Veterinary Assistant Surgeons
Rs. 50 to 125.

(fixed travelling allowance. Free house or house allowance in lieu thereof.)

8. Admission forms may be had free on application to the Principal. Prospectus will be supplied on receipt of 4 as. for each copy required.

PATNA,
25—2—33.

R. T. DAVIS, I.V.S.,
Principal,
B. & O. Veterinary College.

BIHAR AND ORISSA VETERINARY COLLEGE, PATNA.

NOTICE.

A post-graduate class will be held at the Bihar and Orissa Veterinary College as last year from first July, 1933, for the advanced training of Veterinary graduates in (1) Pathology and Bacteriology including Parasitology and postmortem technique, (2) Histology, (3) Veterinary Hygiene, Dietetics and Genetics, (4) Meat and Milk Inspection (5) Veterinary Medicine including parasitic, contagious and inanition diseases. The course will be for six months only for which a sum of Rs. 60 will be charged as tuition fee and Rs. 10 as admission fee. Seat rent for the hostel will be at the rate of Rs. 5 per month.

Private candidates desiring admission sould apply to the Principal, Bihar and Orissa Veterinary College on or before the 15th June, 1933 with the original diploma and a certificate of character.

Further particulars, if required, may be obtained on application from the Principal.

PATNA,
5th April, 1933.

R. T. DAVIS, I. V. S.,
Principal,
B. & O. Veterinary College.

Communication.

To

P. SRINIVASA RAO, G. M. V. C.,
Editor, "The Indian Veterinary Journal,"
Madras.

Dear Sir,

I am in receipt of your *Indian Veterinary Journal* (Vol. IX. No. 3), which through the kind mediation of our colleague Naidu, you had the kindness to send to the Faculty of Veterinary Medicine of the University Leipzig, and which was eventually handed to our Institute of Veterinary Hygiene from the Faculty. I thank you very much for this valuable addition to our Library.

With best respects.

Veterinar-Hygienisches Institut,
LEIPZIG,
February, 8th 1933.

I am very sincerely,
KLIMMER.

Extracts.

CRUELTY TO 40 SHEEP.*

"Terrible Suffering."

Proprietor of a Cattle Company fined $ 200.

The proprietor of the Oriental Cattle Trading Company, a well-known local company, was yesterday fined $ 200 or in default two months' rigorous imprisonment, by Mr. A. C. Boyd, the fourth Police Magistrate, when found guilty of cruelty to sheep.

Mr. V. Bracken, Chief Inspector of the Municipal S.P.C.A., Department, said that while on his rounds on December 9, he inspected the pens of the accused firm at Ginting Lane, off McPherson Road. The pens, however, were empty, but the sheep were in the fields grazing.

In an adjoining field which was partially secluded from public view he saw about 40 sheep which were in an emaciated condition. Most of them were suffering from foot-rot in the early and also the advanced stages. He also found a few suffering from sores on the face and body. He had them transferred to the infirmary, where they were examined by the Assistant Veterinary Surgeon, who confirmed the fact that most of them were suffering from foot-rot and were maggot-bound.

Mr. K. S. Nair, the Assistant Veterinary Surgeon, in his evidence said he was of the opinion that the animals had not been treated, and had probably been in that condition for between 10 to 14 days. He was also of the opinion that the animals had suffered terribly during that period.

* From 'The Sunday Times' January 15, 1933. Singapore, F. M. S.

Accused's Denial.

The accused M. D. Maricar, said he knew the animals were sick but had been treating them with native medicine. He denied that they were maggot-bound, and had foot-rot.

His Worship turned to him and informed him that he had himself seen the animals and knew the state they were in,

Several other witnesses were brought among whom was a European assistant from Messrs. William Jacks & Co., Ltd., who imported the sheep for the Oriental Cattle Trading Company. He said that it was distinctly understood between the two firms that the sheep, on arrival, were only held by William Jacks as security against payment. Any loss by death or otherwise was borne by the Cattle Company. He also said that the feeding and accommodation, and the general welfare of the sheep was in the hands of the Cattle Company.

His Worship in finding the accused guilty remarked that the sheep had clearly been neglected and allowed to suffer unnecessarily.

The prosecution pointed out before sentence was passed that the accused had a previous conviction for overcrowding sheep in 1931. and had been fined.

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11. ANOTHER CASE

Failure to apply treatment to sick cow.

A Bengali named Bazarnath, was brought before Mr. A. W. Hay the second Police Magistrate, yesterday, and pleaded guilty to a charge of cruelty to a sick cow by keeping it for about ten days without medical treatment. Mr. V. Bracken of the Municipal S. P. C. A. Department, said that while on his rounds he saw an emaciated cow in a shed. He examined it and discovered that its right hip joint was dislocated, and there was inflammation of the joint. The left hind leg was deformed, and there were bad sores on both sides of the body.

The Assistant Municipal Veterinary Surgeon examined the cow and was of the opiniou that it had been in that condition for about nine days or more.

The accused, when told this, said he had treated the animal with native medicine,

Giving evidence, Mr. K. S. Nair, the Assistant Municipal Veterinary Surgeon, said he examined the cow, but found no signs of treatment.

The accueed was fined $ 25, or one month's rigorous imprisonment.

The cow was destroyed.

HALF STARVED AND UNDERFED. *

There is evidently a direct connection in India between the poverty of the people and that of their cattle. Orissa is an epitome of human poverty. Rai Sahib P. N. Das, Assistant Director, in charge, Orissa Range, Civil Veterinary Department, is thus reported to have spoken at a meeting of the Cuttack Gorakshini Sabha at which he was presiding the other day.

* From the "*Young India*" *dated* 14-2-29.

" The condition of cattle of Orissa is most deplorable. They keep one dead level of inferiority. They are half starved in dry months and remain underfed during the rest of the year. In short they are mostly a lot of small, weak and emaciated creatures and possess a low degree of vitality and consequently the supply of milk to the people is hopelessly low. There are many people in the villages who have never tasted milk in their life and there are many villages where a chhatak of milk is not available."

"He suggested that in future there should be two sections in such institutions *i.e.*, one for the purpose of giving shelter to the maimed, old and useless animals and the other for the improvement of breeds by adopting up-to-date methods of breeding and rearing."

Enough evidence has been produced in these pages in support of the Rai Sahib's suggestion. Would the trustees of the numerous Gowshallas of the country take to heart the advice given by the speaker.—*M. K. G. (Gandhi).*

THE CENTRAL PROVINCES GAZETTE NOTIFICATION.

Dated Nagpur, Saturday, the 4th February, 1933.

No. 349-154-111--Under rule 81 (b) (i) of the Fundamental Rules, leave on average pay for four months, with permission to prefix Sunday to the leave, is granted to Major R. F. Stirling, I.V.S., Director of Veterinary Services, Central Provinces, with effect from the 13th March, 1933.

No. 350-154-111—Rai Sahib R. V. Pillai, Deputy Director of Veterinary Services, Central Provinces, is appointed to officiate as Director of Veterinary Services, Central Provinces, Vice Major R. F. Stirling, proceeding on leave.

By order of the Government.

(*Ministry of Agriculture*).

E. GORDON,

Chief Secretary to Government, Central Provinces

PROCEEDINGS OF THE BUDGET SESSION OF THE LEGISLATIVE COUNCIL, MADRAS, HELD ON 25-3-33, REGARDING THE VETERINARY DEPARTMENT, AS APPEARED IN THE LOCAL PRESS.

When the Council reassembled after lunch to-day the Hon. Mr. P. T. Rajan moved that the Government be granted a sum of Rs. 8,59,600 for demand—civil veterinary services.

Mr. A. B. SHETTY moved to reduce the allotment of Rs. 18,200 for the pay of establishment by Rs. 100 in order to discuss the policy and work of the department. He said that the veterinary department was a very important department of the Government in view of the future material development of the country. Yet that department was being continuously neglected. The provision made for the expenses of that department was being reduced year by year.

The Minister should exert himself and see that the amount allotted for the expenses in the next year's budget was increased. The work of that department was closely related to the development of agriculture. The cultivators were incurring great loss on account of heavy mortality among the cattle. To avoid that loss, more hospitals should be opened. But the provision made for that was very inadequate. There were only 114 hospitals and dispensaries in the Presidency, but the Agricultural Commission had recommended that there should be one veterinary officer for every 25,000 cattle. If that ideal was to be reached, the Government had to employ veterinary assistants six or seven times the present number. There was a scheme that the Government every year should open six new dispensaries and six new touring assistants to be appointed every year. But all those activities had been put a stop to. The Veterinary College was turning out a large number of students every year, but no work was being provided to these students. They naturally went in search of employment to the neighbouring States and Provinces. The Government must find employment for these students. There was need for the opening of more dispensaries in rural areas. Even in the existing hospitals more assistants could be employed and thus increase the value of this department. A new serum institute had been opened but there were not sufficient number of men for doing inoculation work. The Government could also make it obligatory on the bigger municipalities to appoint veterinary assistants. Propaganda work should be carried on in the mofussil.

In conclusion, Mr. Shetty drew attention to the appointment of a special disease investigation officer and appealed to the Minister not to overlook the claims of senior officers in filling that special post. He hoped that the Government would not appoint a junior officer and thus bring about heart-burning among the officers of the department.

The PATTAYAKAR OF PALAYAKOTAI emphasised the importance of adequate measures to prevent cattle disease, which was decimating the livestock in the villages. He pleaded for the establishment of more veterinary hospitals and dispensaries. He said that the Government ought not to charge any fee for the inoculation of cattle.

Mr. K. A. NACHIAPPA GOUNDER said that the Government ought to be progressive and sympathetic in their attitude towards the veterinary department. The dispensaries that were 'axed' last year should be reopened and more should be started in the taluks where they were needed most. As far as possible, they must take the veterinary aid to the very door of the villagers. Then only the veterinary department would get popularised.

Mr. P. V. KRISHNAYYA CHOUDRI said that the veterinary department was not at all popular because there were not a sufficient number of dispensaries. He referred to the needs of the Guntur District in that particular.

Mr. NARASA REDDI appealed to the Minister to redeem the promise of the Government to establish a dispensary in Jammalmadugu.

Mr. PEDDI RAJU also reminded the Government of their promise to start a dispensary at Tadepalligudem.

Mr. V. T. ARASU said that Government should appoint to the department only persons with clinical experience and with experience of the curative side of the work. He mentioned that in reference to the appointment made of a Cattle Diseases Investigating Officer,

Mr. BAYABANI SAHEB pleaded for the opening of more veterinary dispensaries all over the Presidency and particularly in the Ceded Districts and for special facilities for Muslim students to join the Veterinary College.

THE MINISTER'S REPLY

The Hon. Mr. P. T. RAJAN, replying said that the provision for veterinary services made in the present budget was larger than was made last year. The increase was due to the starting of the Serum Institute. The record of the department was not one of expanding activity last year; he hoped that when the finances of the province improved, the record would be far brighter. Some dispensaries were closed last year; but that was done less as a measure of retrenchment than because of the poverty of attendance there. In that connection, he referred to the charge made by some members that urban areas were being favoured with dispensaries and rural areas were neglected, and said that, if any distinction was being made between rural and urban areas, it was in favour of the former. But he must observe that while attendance at the urban dispensaries was satisfactory, some of the rural dispensaries were so poorly attended that they had to be closed down. Suggestions had been made for more touring officers. The department now had about 123 veterinary assistants for that purpose working out at one officer for every two or three taluks. Those were supplemented in times of epidemics among cattle. Some members had stated that touring officers arrived after the epidemic had passed off or taken its full toll. Perhaps, such a thing might have occurred in one or two places; but there were strict instructions issued to the officers to see that the necessary staff were sent immediately to the affected area to cope with the outbreak.

The Hon. Mr. P. T. RAJAN next answered the suggestions made in regard to the Veterinary College. He said that when the College was started, the idea was to train a sufficient number of persons for manning the Government veterinary services and also to provide facilities for young men to qualify themselves for setting up private practice. But, he was afraid young men who joined the College did so more or less with a view to securing an appointment under Government. The sooner young men joined the College without that motive or at any rate with their minds clear that Government jobs would not be available for all of them, the better it would be. In that connection, he said it was open to municipalities and local bodies to open out avenues for young men by subsidising them to engage in veterinary work or entertaining them as Veterinary Health Officers. Answering the criticism regarding the appointment of the Cattle Diseases Investigation Officer, he said that a junior had to be appointed because seniors were not willing to take up the job. But the appointment was so made as not to affect the seniority of the men adversely.

Concluding he said that in regard to the departmental activity the main obstacle was the unwillingness of people to take advice; but the department was doing their level best under the circumstances. He promised to consider the several suggestions made by the various members to make the departmental work more effective.

The cut motion was withdrawn and the main demand was then put to the House and passed.

Questions and Answers.

The following were also among the questions put and answered in the Council on Saturday :—

Disease Investigation Officer, Civil Veterinary Department.

Q.—A. B. SHETTY: Will the hon. the Minister for Public Works be pleased to state—(a) whether any nominations have been received by the Government for the post of a Disease Investigation Officer in the Civil Veterinary Department; (b) if so, what their names and qualifications are; and (c) whether seniority and qualifications will be given due consideration in making this appointment ?

A.—(a) Yes; (b) the selection of an officer is under consideration and the information cannot, it is regretted, be published at this stage; (c) due consideration is always given to seniority provided special qualifications required for the post are also available in senior men.

Mr. A. B. SHETTY, in a supplemental question asked whether the Government had not selected the 135th man in the list, who had no clinical experience.

The Hon. Mr. RAJAN replied that the appointment had not yet been made.

Q. Will the claims of the senior men who have sufficient laboratory and clinical experience and who have a record of efficient service, be taken into consideration ?

A : They are being considered.

Mr. ABDUL HAMEED KHAN : What is the reason in selecting a man who is 135th in the list.

A : The man must possess qualifications which are required by the Government.

Q : What are those qualifications ?

A : The qualifications which are necessary for the post of a disease investigation officer.

Q : Are not those qualifications possessed by the other gentlemen ?

A : Might; but not to the extent required.

MR. SUBRAMANIA BHAT : Was not a cablegram sent to the candidate to give up his post-graduate study and take charge of the appointment ?

A : I am not aware of it.

MR. V. P. NARAYANA NAMBIAR : Is it proposed to make the appointment on a contract basis ?

A : This appointment is proposed to be made outside the cadre.

MR. NAMBIAR : Did the Madras Service Commission object to this gentleman being taken on the regular cadre ?

A : Notice.

In reply to MR. A. RANGANATHA MUDALIAR. the Minister said that the selection had not been made. The recommendations sent to the Government were under consideration.

MR. FOCKER asked whether the Minister had applied his mind to the various qualifications of the candidates and their experience in service.

A : Yes; on the information given by the Head of the Department.

Reviews.

Veterinary Obstetrics and Zootechnics :—By Howard N. Beeman. Publishers :—Bailliere, Tindal & Cox, 7 & 8, Henrietta Street, London, W. C. 2 Size 5¾×8¼. Pp. 131. Price 15s. net.

Major Beeman of the U. S. Army Veterinary Corps has enriched the veterinary literature by bringing out an eminently readable book on Obstetrics and Zootechnics. In the small compass of 125 pages the author has been able to present Equine Obstetrics in a concise and lucid manner. It also contains much up-to-date information on the subject.

The author has tried to treat the subject of obstetrics in a scientific chronological order beginning with the basic facts of Obstetrics, Anatomy and Physiology to be followed by the problems incidental to each succeeding period of the cycle of reproduction. We congratulate him on his success he has attained in his endeavour. The usually important section of Dystokia and its handling has been omitted in this book; nor does the author attempt to say anything other than of Equine obstetrics.

The book is divided into three parts. The first part of three chapters deals with Obstetrics, Anatomy, Physiology and Embryology. The second part is the Zootechnics section as is named by the author. The foaling and breeding season-the five chapters of this section contain much useful knowledge to the breeder. It tells him how to handle brood mares and stallions and the care of the sick and healthy foals. The last part has six chapters and deals with the pathology of Pregnancy and Sterility; the perusal of this part by any one will add to his knowledge of Sterility and the Bacteriology of the genital organs.

The printing and get up of the book is on the usual superior style that we have come to associate with the Veterinary publications of Messrs. Bailliere Tindal & Cox.

Here is a book that can guide the breeder and veterinarian and we can confidently recommend it to the profession.—*K. S. N.*

The Milk Supply of Lahore in 1930 :—The Board of Economic Inquiry, Punjab, arranged for an inquiry into the Milk Supply of Lahore in 1930 and deputed Mr. Roshan Lal Anand, M. A., to conduct under the expert supervision of Prof. A. C. Aggarwala, B. Sc., Hons., M. R. C. V. S., Capt., A. I. R. O., of the Punjab Veterinary College.

The fruits of their labour are embodied in the form of a book, which is at once a credit to the authors and a valuable contribution to the existing literature on the milk supply of many an Indian city. The report is a comprehensive survey of the many intricate problems connected with the subject, and includes the following chapters : I. Historical, II. Supply of Milk, III. Demand for Milk, IV. Price of Milk, V. People engaged in the Milk Trade, VI. Milch Cattle and their Feeding, VII. Conclusions. The Appendices to the work include general information about Milk and its Properties, its value as an Article of Diet and the Existing Legislation Regarding Milk Supplies in the Punjab. A copy of the many questionnaires used in the Inquiry is also given at the end.

Problems of the milk supply of Lahore, as are discussed and investigated into, are not peculiar to Lahore alone, but are common to most of the Indian cities, and as such this report is bound to be much appreciated by all interested

in the subject. The survey has been conducted with a method and thoroughness that might serve as a model for enquiries of a similar nature in other towns and cities of India. In a country which has more head of cattle than any other in the world, where more than 80 per cent of the people are agriculturists, where annually the task and problem of feeding these immense herds taxes the utmost capacity of their owners, where the economic standard of living is about the lowest in the world, and where the condition of milk supply is as bad as it could be, such educational material should be of immense value. We congratulate the Board for having made provision for conducting an inquiry into a subject of such vital importance to the country and for their choice of the right expert to supervise the inquiry.

Well, it is yet another feather in the cap of our esteemed colleague, Prof Aggarwala, who seems to be out to prove the real worth of a veterinarian, if only opportunities are given him,

The report is printed by the 'Civil and Military Gazette' Press, Lahore, and is priced at Rs. 2 only.

"The Veterinary Bulletin" Vl. 3. No. 1:—As a new journal the beginning of the third volume is of importance in that, as the result of the experience acquired, some consolidation of the general policy with regard to its production has been possible. Volume 1 (1931) was issued in four quarterly numbers. The beginning of a regular monthly issue commenced with Volume 2 (1932). In. volume 3 (1933) they have been able to make slight adjustments in the lay-out pages, resulting in more room for the text, so that a much larger number of the abstracts covering more references will be included than in the past.

An important feature of the number is the inclusion, in the first twelve pages, of the list of publications to be covered from 1933 onwards for the purpose of selecting references for abstracting in the *Veterinary Bulletin*.

Sreenivasan's Medical Hand-Book:—This is a compilation of useful material for ready reference by Medical practitioners and students. Chapters on Caloric value of food stuffs and their vitamin contents: Incompatiables; Poisons and Antidotes &c., are sure to be appreciated. The 1932 additions to British Pharmacoepea are also included. The book will be helpful to Veterinarians as well. The price of the book is only Rs. 1-8-0. We congratulate the author for so thoughtfully placing a book of this nature in the market and that at such low price. Copies can be had from the Bharath Pharmacy, Pycrofts Road, Triplicane, Madras.

Annual Report of C. V. D. Madras, for 1931-32:—The year was comparatively a healthy one, motality under each head being much less than in previous year. The work turned out both on the preventive and curative sides, was on the increase. The absence of 'Circle Reports' is a step in the right direction, materials from which can well be embodied in the Director's reports without making the report voluminous. It is noteworthy that nothing is mentioned regarding the steps taken to give effect to the recommendations of the Royal Commission on Agriculture. Expansion of the department is at a stand still. Four dispensaries have been closed and six men who were entertained on 1st May 1931, were sent back home on 1st September 1931, as a measure of Retrenchment! We only hope that "even these days will pass off" and that the Director will do his utmost to expand the Department, with the dawn of better times.

Annual Report of C. V. D, Punjab for 1931-32:—The report as usual records very good work done in all branches of the Civil Veterinary Department, Punjab. The following points in the report need wider publicity for other presidencies to follow:—

(1) A closer net-work of veterinary hospitals is gradually being secured which is increasing the efficiency of the Department for dealing with live-stock work and veterinary aid.

(2) As it is becoming increasingly difficult to absorb all the diplomates of the Punjab Veterinary College into the Department, attempts to find additional spheres of activity for them are being made. The question of absorbing them as Hackney Carriage Inspectors and Cruelty Inspectors under local bodies, and Societies for the Prevention of Cruelty to Animals, respectively is receiving attention.

Annual Administration Reports of the Civil Veterinary Department, Bombay Presidency, including the Bombay Veterinary College, the Bombay City and Harbour Veterinary Department and the civil veterinary department in Sind, for the year 1931-32:—Bombay seems to be still moving slow in the matter of development of the Department. We are at a loss to understand the reason for this. Long before other presidencies thought of Veterinary Science, Bombay had started a College, and Department for it. She has been supplying the necessary staff to start work in other presidencies. But yet she seems to be unwilling to grow! An attempt has been made towards S. S. inoculation of cattle against Rinderpest. The year was comparatively a healthy year. There is nothing to record either under Research or in the matter of increase of hands and opening of more hospitals.

Obituary.

We regret to record the sad and untimely demise of P. Tyagaraj, G. M. V. C., of the Civil Veterinary Department, Madras, on the 14th of February 1933, after a service of 14 years. He was only 39 years of age and that makes the grief all the more poignant. We offer our heart-felt condolence to the members of the berieved family.
