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Veterinary Surgeon,
MADRAS.

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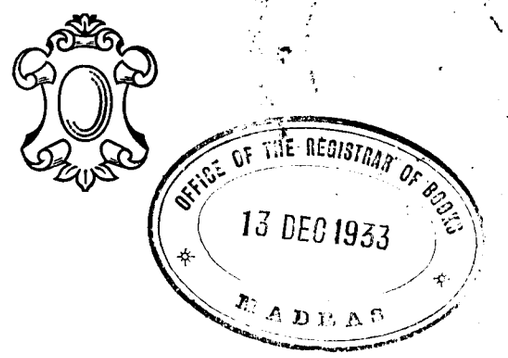

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NOTICE

The Indian Veterinary Journal

A quarterly record of Veterinary Medicine and Surgery devoted to the cause of the Veterinary Profession.

PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION.

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THE INDIAN VETERINARY JOURNAL.

(The Journal of the All-India Veterinary Association)

Vol. X.] OCTOBER, 1933. [No. 2.

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CONTENTS

Khan Bahadur SHEIK NIAZ MOHAMMAD, G.P.V.C.,
who has been appointed the Offg. Director, Civil Veterinary Department, U. P. (India)

Mr. A. RAMALINGA MUDALIAR, G.M.V.C.,
Veterinary Assistant Surgeon, C.V.D., Madras.
Who retired from Service on 13-5-1933.

THE
Indian Veterinary Journal.

Vol. X] OCTOBER, 1933. [No. 2

Editorials.

A PIONEER'S RETIREMENT.

"Not all who seem to fail have failed indeed;
What though the seed be cast by the wayside,
And the birds take it? Yet the birds are fed."

Little does the world know of its truly great men. A life need not necessarily be grand to be great. A life spent in selfless service to others, suffered in the act and borne the 'Cross' with cheer is far nobler than all the empty pageantry of gilded Royalty. The world will be a disgusting place to live in but for such men. We are moved into such thoughts, as we sit down to record in our pages the noble life of Mr. A. Ramalinga Mudaliyar who retired from Government service recently.

Mr. A. Ramalinga Mudaliyar needs no introduction to Indian Veterinarians. He has visited practically every Province in India and can lay claim to have cultivated the acquaintance of many a Veterinarian. Madras in particular can ill-afford to forget him. We venture to say that it has reason to be eternally grateful to him, as the founder, organiser and director for many years of the Madras Branch of the All-India Veterinary Association.

Born of parents of reputed character, in an aristocratic family in the southernmost district of Tinnevelly in September 1881, Mr. Mudaliyar had the initial advantage of all that wealth and good training could bestow on one to enter life in the world. Not far away from the famous falls of Courtallam lies his village, Idaikal, in the midst of a rich pastoral scenery unforgettable to those who have seen it. One with poetic fancy might say that

Proud Nature unalloyed by the antics of the so-called civilisation holds sway in those parts. They say that environments contribute a good deal to the making up of character and if so, it is no wonder that Mr. Mudaliyar proved to be so pure in thought, word and deed. His robust independence, his delicacy of his feelings, his upright character and his unbearable hatred of all that smacks of hypocracy are probably the imprints of such environments in the early days of his life. The age of frisking and frolicking amidst wild nature cannot be ever-lasting, however good it might be. Young Ramalingam had soon to leave his village for higher studies. After passing his Matriculation, he was appearing for the old F. A. examination from St. Joseph's College, Trichinopoly, when he took suddenly ill and had to discontinue his studies. He thus had the advantage of learning under such eminent educationists as Rev. Father Santiago and Mr. Arpudaswamy Odayar. His uncle Rai Sahib V. P. Subramaniya Mudaliyar, who is a Veterinarian himself, advised young Ramalingam to join the Madras Veterinary College, when it was first started in 1903. He passed out of the College in 1906 and thus is one of the first products of that great institution.

Entering service on 13-5-1907, Mr. Ramalinga Mudaliyar soon rose to the position of a Veterinary Inspector and continued to hold that appointment for over eight years. When as a measure of retrenchment the cadre of Veterinary Inspectors was abolished by the Government, he held charge of many an important Veterinary Institution with success.

After a few years of experience in Government Service, he found that the members of his beloved profession were subjected to untold iniquities, at which his heart melted. He was planning for many years how best to get rid of such iniquities. When he thought that the time was ripe to make a move in the matter, he arranged for an informal gathering of Veterinary Assistant Surgeons at Vellore in December 1920. It proved to be a success beyond all expectations. It was resolved at that meeting to start an Association known as "The Veterinary Graduates' Association, Vellore" to improve the status of the profession scientifically, economically and socially. It was at that memorable meeting papers presenting the several difficulties which the profession was labouring under were read and they came in for a good deal of criticism at the hands of the Powers-that-be. Mr. Mudaliyar who was unanimously elected as the President of the newly started Association was the main target of all official wrath. He wrote and asked the then Superintendent of the Civil Veterinary Department, Madras, for "Co-operation and guidance"; not only they were flatly denied but a campaign of

calumny was started and heaven and earth were moved to get the organisers punished under the Government Servants' Conduct Rules. It was a move to throttle the newly born Association at its very birth. Need we say what an unequal quarrel it was! The head of the department persuading an all powerful Government to punish the organisers; and the helpless subordinates looking up to Heaven to save them from the gallows, depending solely on the righteousness of their cause. But have not causes rooted in honest purpose and deep charity flourished in worse conditions? It was during that fight that the best in Mr. Mudaliyar could be seen. He proved himself to be a valiant fighter and a born leader.

At the terrific turn events were then taking, all looked so gloomy and even the stoutest heart might well have quailed. But Mr. Mudaliyar stood firm, calm and serene at his post and quoted with a smile "Poor Man! I know he would not be a wolf, but that he sees the Romans are but sheep". It must be said to the credit of the profession in Madras that it stood by him loyally at that hour of trial. Truly leaders are born and not made! He was prepared to suffer and he did suffer in the long run for the sake of profession. But in the open fight above mentioned Mr. Mudaliyar came out successful. The Government of Madras in their G. O. No. 1671 dated 9-9-1921 said "The Veterinary Graduates' Association, it is understood, does not claim to be Service Association.....the Association being a private organisation is not amenable to those (G. S. C.) rules." The profession heard the news with a sigh of relief. Mr. Mudaliyar with his characteristic coolness cried out "Let us not rest on our oars." The process of consolidating the Association then began. He spent anxious nights and days in rearing it with a love too deep for words. The Association grew in strength from day to day. Annual meetings and conferences were held at which very many professional papers were read and discussed and resolutions voicing the grievances of the profession were duly passed and communicated to the Government.

Mr. Mudaliyar soon got in communication with other similar workers in other Presidencies and Provinces and began strengthening the All-India Veterinary Association. He got his Madras Association affiliated to the Central Body and personally attended the First All-India Veterinary Conference held at Lahore. On his way to Lahore he toured extensively in Bihar and Orissa, Bengal, United Provinces and Bombay and did much to spread the 'Association spirit' amongst the members of the profession. Later he worked hard along with others to found this very *Journal*, which will, we hope, God willing, keep the memory of such men ever green.

Mr. Mudaliyar knew all the time that he was a 'Marked man' by the authorities and there are other methods of putting out a man than at the mouth of a machine gun; but he went on undaunted with what he thought to be his duty towards his profession. He was subjected to many a pin-prick and he bore it all calmly. We do not want to get into details. They will fill a modest volume. The height of unfairness in this unequal quarrel was reached when he was debarred from being promoted to the Gazetted rank, which he otherwise so richly deserved. The profession heard the news with disgust and to this day remembers it as a piece of grave injustice and looks upon Mr. Mudaliyar as a Martyr.

With the influence at his command Mr. Mudaliyar could have got the decision revised and thus tried to get into the Gazetted service. When a few of his colleagues suggested the idea to him he replied "I do not believe in standing at the door of any official however intimately known to me—for any *personal* favour. Let me play my role honestly and well in whatever sphere it has pleased Providence to place me".

Mr. Mudaliyar continued to be the President of the Madras Branch of the All-India Veterinary Association for a number of years until age began telling on his health, when he got the task transferred to younger shoulders. It was a fatal transfer. Ever since that, Madras has been on the downward march and one wonders what charm was there in the man who organised such highly successful and spectacular gatherings in the teeth of a powerful opposition!

Mr. Mudaliyar took the earliest possible opportunity to retire from official service. He laid down his office on 13—5—1933 and is now a free man. He has settled down to farm-life and we are sure, that God has intended that he should enjoy the evening of his life far longer and more fully than what is ordinarily given to a Government servant who serves his full term and what more, gets it enhanced himself through extensions! We wish Mr. Mudaliyar a long and happy retired life!

The greatest tribute that the profession in Madras can pay to this great man, is to keep alive and active the Association founded by him with such love and at such cost!

———

CIVIL VETERINARY SERVICES IN INDIA.

IV.

The Punjab.

The land of the Five Rivers was one of the oldest Provinces in India to have a Civil Veterinary Service, but the activities of the Department in its early days, were almost entirely confined to the care and management of the pony and donkey stallions with a view to improve the local breeds. There was no organised agency for dealing with the outbreaks of contagious diseases of cattle, for the Local Boards, whose duty it was to make provision on this behalf, had neither the qualified men nor the resources necessary for the purpose. Some of these Local Boards had in their employ one or more Veterinary Assistants known as "Salustries"—a class of men who had received some elementary professional training in the vernacular schools established in the early days for Dressers for the mounted section of the army in India.

The recognition of the need for professionally trained men to combat the ravages of cattle diseases in the Province, resulted in the establishment of the Punjab Veterinary College, at Lahore. This institution provided for a three years' course of professional training, but the medium of instruction was the vernacular, and it continued to be so far some years. Among the pioneers in the field of Veterinary Education in this country, the names of Col. Pease and Col. Walker deserve prominent mention. It was largely due to the breadth of vision, zeal and enthusiasm of these gentlemen that the Punjab Veterinary College to-day occupies the proud position, as one of the best Institutions of the kind in the East, in the matter of building, equipment &c.

We reproduce below an account of the history of the College, furnished to us by Prof. Karam Ellahie of the Punjab Veterinary College through the courtesy of the Principal Mr. W. Taylor.

"The foundation of the Punjab Veterinary College was laid by Col. J. H. B. Hallen in the shape of an elementary school in the Remount Depot at Hapur, where military and civil students were given elementary training in the Veterinary Science. The Remount Depot at Hapur was soon abolished, and the Veterinary School was transferred to Lahore in the spring of 1882, with Col. Kettlewell as the first Principal. The staff of the school consisted of Mr. John Burke and two Indian Professors, *viz.* K. B. Dr. Rahim Khan and K. B. Dr. Syed Amir Shah whose services were borrowed from the Medical College. The College, in its initial stages, had no suitable building nor equipment.

This Veterinary School was started as an experimental measure for five years and was placed under the Military Secretary to Punjab Government. The post of Military Secretary was soon abolished, but the College had proved its usefulness during the short period of its existence. In view of the fact that its maintenance cost was low and popularity great, it was made a permanent institution and placed under the control of the Financial Commissioner and the Supervision of Director of Land Records. Col. Wace, the then Financial Commissioner, accorded sanction to the proposals relating to the construction of buildings in confirmity with the requirements of the School. In 1887, when Mr. John Burke relinquished charge, K. B. Syed Mehtab Shah Gillani was appointed as a Professor and a year later K. B. Syed Sardar Shah Gilani and K. S. Raja Ghulam Hussain were added to the staff. At the end of 1890, Col. Kettlewell was transferred to Madras and was succeeded by Col. J. Nunn. During his tenure of six years, the School continued making satisfactory progress and very authentic and voluminous books on Veterinary Science were compiled in Vernacular and added to the curriculum Some more buildings were added as adjuncts and a Farrier Class was also started. Col. Pease, who was then a Professor, started a quarterly Veterinary Journal in Urdu which soon became very popular.

In 1897, Col. J. Nunn relinquished charge and was succeeded by Col. H. T. Pease as Principal, in whose term of Office the School made unusual progress. In 1900, the period of the course was raised from two to three years and the syllabus was considerably augmented. At the same time the name of the Institution was changed to "The Punjab Veterinary College". In 1903, a separate Contagious Ward was built and placed under the charge of an efficient European Officer. Two years later the Ajmer Veterinary School was abolished and the whole of its teaching staff was merged in the Punjab Veterinary College, About the same time the Canine Ward was separated from the General Hospital and a Dressers' Class was instituted under the supervision of the Officer-in-charge, Hospital Section. In 1907, Col. Pease was promoted to the post of Inspector General of Civil Veterinary Department and was succeeded by Col. Smith, who remained Principal up to 1912. Major Dawson, a Professor of the College, started a quarterly Journal in Urdu which ceased publication after an existence of two years. In 1912, the post of Inspector General of Civil Veterinary Department was abolished and Col. Pease resumed charge as Principal from which post he retired in 1919. The Punjab Veterinary Journal was started in 1913 and is still being published by a few enthusiastic members of the staff. This Journal is doing great service to the

profession. In April 1915 the College was shifted from the old and scattered buildings to the present splendid, well-situated and up-to-date buildings. In 1915, a Post-graduate Course was started in English, which had to be suspended after one year owing to the Great War. Similarly another attempt was made to introduce a four years course in Urdu for Civilian students to be carried on simultaneously with a three years course for military students. This course was commenced but did not materialise owing to the War.

In 1919, Col. Walker was appointed Principal. The most remarkable change during his time was the institution of four years English Course at the College in place of the old three years Urdu course.

Originally matriculates were admitted to this course but now admission is restricted to candidates who have passed the Intermediate Examination of the Punjab University or equivalent test. The Graduates of the College are awarded the Diploma of Licensed Veterinary Practitioner, Punjab. Negotiations were carried on for the affiliation of the College to the Punjab University but the scheme did not mature.

The syllabus of the course is not only drawn on similar lines as that of the British Colleges but also is more comprehensive in certain respects. In addition, post diploma courses are provided for qualified men who are sufficiently conversant in English.

The staff of the College consists of eight Professors including the Principal, one Hospital Surgeon, two Lecturers, seven Assistants and Clinical Assistants, one Head-farrier, four Demonstrators, an Artist, five Clerks, one Librarian, one Store-keeper, two Compounders, seven Laboratory Assistants, nine Laboratory Attendants and a reasonable number of menials. The College is very commodious and self-contained and is certainly as well equipped as any Veterinary College in the British Empire. The main block consists of two Lecture Theatres, two of which can be darkened for demonstrations with the Epidioscope, a Chemical Laboratory, a Physicl Laboratory, a Materia-Medica Museum, ten offices for the staff, Store-rooms, Principal's Office, Clerical Officce and Record Room, a staff room, the general museum and the library. The Pathological section consists of a Lecture room which can be darkened, four offices for the staff with laboratories, a students' laboratory, a kitchen, a sterilising room, a cellar for storing sera and vaccines, an incubating room and an Artist's room with a micro-photographic apparatus and dark room. In addition, a post-mortem room and a house for small animals are provided. A refrigerating cabinet has been installed. The apparatus including the epidioscope, the Centrifuges, the still

and the micro-photographic apparatus are served with electric power. A gas plant supplies gas to all the laboratories. Attached to this is the contagious ward, a rabbittary, dog-kennels and incinerators. In the Laboratory a number of sera and vaccines is prepared. Anti-rabic vaccine is a speciality and certain sera are supplied to medical practitioners.

The Anatomical and Physiological sections consist of a Lecture room, two offices, an excellent dissecting room equipped with two of Bradley's dissecting machines, a well equipped anatomical museum and a physiological laboratory, which in addition to the necessary equipment contains an electric Kymograph.

The Hospital Section comprises indoor accommodation for 60 horses and cattle in the general ward and a large outdoor clinic shed. In addition there is a cruelty ward and a separate canine ward, the latter having general and isolation wards and a first class operating theatre for small animals. The wards are equipped with a central heating system. There are two operating theatres for larger animals, one of which is equipped with an excellent operating table for horses and cattle with a gallery for students. An X-Ray apparatus, an electrocuting machine and a plant for the preparation of electrolytic chlorogen have also been installed in this theatre and a lethal chamber in the canine ward. The out-door clinic shed includes washing boxes, casting beds and stocks of various descriptions. There is a dispensary and a store-room at hand. A dark box fitted with electric light for opthalmic work is also available. There are three offices for the staff, a student's duty room, an instrument room, a trotting shed and a room for the supply of hot water. Attached to this section is a shoeing forge, where a course of nine months is given to Farriers in shoeing. There is a special weigh-bridge for horses and cattle and Dutch-barns for fodder are at hand.

A large number of the teaching staff and most of the menial staff are provided with residential quarters.

Adjoining the College is the hostel for students and the playing field. The new hostel was built some six years ago, though a portion of the old hostel is still available for the residence of students at a cheaper rate. The new hostel in addition to the residential rooms includes Superintendent's quarter and office, and well equipped common room, three kitchens, three dining rooms, a dispensary with a sick room, a reading room, bath room, etc.

Athelitic sports are encouraged and tournaments in the various games are held annually. The winners in track events are awarded handsome prizes.

For the water supply of the College and the hostel, a tube well has been provided, which supplies a distributing tower in the College and four tanks in the hostel. Underground drainage is provided both in the College as well as in the hostel.

Mr. W. Taylor, the present Principal of the College, succeeded Col. Walker in 1926 and has contributed his share in the improvement of the College in many ways. The post of the Director of Veterinary Services, Punjab, was created a few years ago and the College has been placed under his jurisdiction instead of the Director of Agriculture.

The Imperial Council of Agricultural Research has appointed an Investigation Officer for Punjab, who is stationed at the College and works under the control of the Principal.

The College being an up-to-date Institution both in regard to the staff and equipment, has been considered suitable for conversion into the proposed Imperial Veterinary College for India. This scheme is still under consideration.

The Diplomates of this College have always served creditably in many parts of the world. Hundreds of Veterinarians were supplied by this College in connection with the Wars in Afghanistan and on the Frontier and also on the occasions of the Expeditions sent to Burma, South Africa, China and last but not the least during the Great War. It is, therefore, permissable to say that the Punjab Veterinary College, has, from the very beginning, possessed the status of an Imperial College".

Whether the Punjab Veterinary College has the status of an Imperial College or not is a question with which we are not concerned at present, but there is no doubt that Veterinary Education has made satisfactory progress in the Province.

(To be Continued.)

THE LIVE-STOCK TRANSFER.

The problem whether the improvement of the live-stock of the land should continue to be under the management of the Agricultural Department or entrusted to the Veterinary Department seems to be still engaging the attention of the authorities concerned in various Presidencies and Provinces. With such an expert body as the Agricultural Research Council now functioning in India, it must be an easy matter to come to a decision, if an impartial view of the question is taken.

We honestly believe that all concerned over the question are men of proved mettle who place the interests of the land before anything else. It is not a partisan quarrel over the loaves and fishes of office. It is neither a question of one losing and the other gaining,

nor is it a question of prestige. It is a question of vital importance to the land, which all of them so dearly love.

Excepting in the Punjab, this work is, in the rest of India, we believe, in the hands of the Agricultural Department. We are thankful to them for what has so far been done. With their hands full with other problems more in their line, this live-stock question can at best receive only a minor consideration. Though there is a separate Live-stock section under the Agricultural Department in certain parts of India, the amount allotted for it is very meagre and the staff very limited. Speaking from our experience in the Presidency of Madras, it is painful to record that instead of expansion of the Live-stock section, there has been a good deal of curtailment in recent years and a cattle farm has been closed down even. We do not want to tread on any controversial grounds. We sincerely believe that the time has come when the work should be entrusted to the Veterinary Department and given a trial for the following reasons :—

1. Such work is in the hands of Veterinarians in most of the advanced countries of the world and we must be benefitted by their experience.

2. Public opinion has voiced the feeling that the progress so far made is not in porportion to the time and money spent.

3. The Cattle Farm at Hissar, the biggest in India which is under the managment of the Veterinary Department has proved to be a huge success, removing the need for any experimental comparison and providing an excellent example for other Presidencies to copy.

4. The Veterinarian is best fitted for the task through his scientific equipment, daily avocation and natural aptitude. His main duty is with the animals and animals alone and it is a mistake to think his legitimate sphere begins where the disease makes its appearance. There is more to be done while in health than in disease and the old proverb ' Prevention is better than cure' has not lost its truth because of age. Even now the removal of scrub bulls, pre and post natal care and management, attending to cases of difficult parturition, calf-rearing, treatment of parasitic diseases, attending to deficiency diseases, solving problems of sterility, preventive inoculations against contagious diseases, etc., etc., are all done on a Cattle Farm by a Veterinarian. The only other works of stable or stall management and keeping up records following principles of breeding can very well be done by him.

5. Paucity of men which used to be an old excuse is no longer a factor against the transfer of this work to the Veterinary Department.

6. Under the Agricultural Department only a section with very few hands is working and propaganda work worth the name in the several districts has not been possible; whereas the entire staff of the Veterinary Department can be saddled with a good deal of live-stock improvement work in the districts.

We hope the above points are weighty enough to effect the much needed transfer. We fail to understand why even the consideration of this question is being postponed from time to time. Is it because the various Advisory Committees do not realise the seriousness of the question ? We hope not. We feel the Agricultural Research Council should make a definite move in the matter.

A RURAL DEVELOPMENT SCHEME.

Not far away from the City of Madras, an interesting experiment has been launched upon, which from the programme chalked out, promises to provide a valuable study in the matter of developing Rural India. The organisers of the scheme, we are sure, are quite alive to the stupendous nature of the work before them. Like good pioneers, their ambition is merely to wield the spade and leave it to others to raise the superstructure. No body can expect anything in the nature of milk and honey flowing in the area under experiment. But the spirit behind it is laudable.

It is an unfortunate fact that pessimism still holds sway in this old world of ours, which does not seem to have grown wiser with experience! Men are therefore not wanting who mock at such useful toil and put on the air of "Wait and see". But no piece of any human endeavour has been an unqualified success ever since the dawn of this world. Truly, failures have been stepping stones to success. It is on the failures of others, edifices of success have been built by subsequent men. What is wanted therefore is helpful suggestion and we hope the new scheme in Madras will have this in plenty.

The little town of Tiruvellore nestling amidst a grove of palm trees about 27 miles to the South-west of Madras, is the centre of the area selected for the new scheme. It is a place of pilgrimage of no mean repute. Who knows if in years to come Tiruvellore will not be remembered for this noble attempt at economic uplift of the poverty-stricken ryot, as much as the presiding Deity within the sacred precincts of its temple, with red-striped walls and a magnificent tower!

Veterinary Science, as we have insisted very often in these pages, has rightly been included in this scheme and a Veterinary Assistant Surgeon of experience has been posted for this work. His task will be to conduct a survey of all Live-stock in the area from the point of view of incidence of various diseases; concert measures to protect them from all such ravages; remove the scrub bulls and in collaboration with the Agricultural Department, provide suitable breeding bulls at convenient centres; make arrangements for the supply of wholesome milk and meat; instruct the people on Veterinary Hygiene and Dietitics; conduct lantern lectures on useful Veterinary topics and in short, make the expert services of a Veterinarian available at all times in the area and see how it works.

In the same way, other Departments, such as Public Health, Agriculture, Education, Co-operation, Industries, etc, are working in the area doing intensive campaign in their respective work and trying to watch how Rural India responds to such stimulus. The area will also be connected with the outside world through Radio, which will also be utilised for quiet and convincing talks on useful topics. It is, we believe, a Five year plan and the whole scheme is under the *able direction of* Lt. Col. Webb, the Director of Public Health in Madras. We have had the pleasure of listening to one of his speeches on this scheme and we felt that if everyone engaged in the task were to imbibe a tithe of his dynamic enthusiasm, the success of the scheme is assured. The finance is to come from that world famous charities of Rockfeller and we are sure that nothing would be wanting in that direction.

One word of advice to the 'labourers' in the field. Every one engaged in the task must realise that an invaluable opportunity has been offered him to serve his mother land. He must consider it a sacred duty and try and give his best for the scheme. It is the perfection of the parts that lends itself to the final perfection of the whole. *No other extraneous* consideration should weigh with them. If they feel they have not the necessary spirit of humble service, they must say so and make room for such men. Let it not be said that the sons of the soil do not care for their own kith and kin as much as foreigners who are keen on this work.

But what we have said above is merely in the nature of a warning and does not in the least indicate any slackness on the part of the noble band of workers already in the field. They are the pick of their respective Departments and we learn they have already taken to their work like fish to water. We wish the scheme every success.

A CURIOUS EDITORIAL CORRECTION.

The 'Veterinary Magazine' of the United Provinces in its issue of August 1933, apparently in a very petulant mood, takes us to task for what it considers to be a wrong lead given by us! We assure our esteemed contemporary that we never intended to indulge in any such pastime. We are prepared to stand by what we have written and we request our contemporary not to accuse us, if it is not able to justify its editorial comments when questioned.

Going through our editorial under reference "Madras Veterinary College Research" once again, we fail to find any room for all the imaginary and implied interpretations tried to be imported into it. The article was intended primarily for publication in the lay Press to keep the public informed of such outstanding pieces of Research by Indian Veterinarians, as the very language of the article divested of all technical references would indicate. Beyond paying a general homage to all the three workers, there was no thought of determining the question of priority in that article. Later it was included in our *Journal* also. Our contemporary would have done justice to us if it had only quoted fully our editorial notes published in July 1932, instead of omitting very vital portions of that note. We wrote "Capt. S. Datta, B.Sc., M.R.C.V.S., was the first to observe Schistosomes in Nasal Granuloma, at Muktesar. We are glad to note that two other workers, *viz.* Mr. P. G. Malkani of Patna Veterinary College and Mr. M. Anant Narayan Rao of Madras Veterinary College, have also *independently found them almost simultaneously in such cases.* These workers have therefore confirmed Mr. Datta's findings". We have not said anything new now, besides what we wrote over a year ago.

Our bonafides will be apparent when it is pointed out that in an earlier issue (April 1932) we wrote "on the 18th February 1932, Professor P. G. Malkani, B. A. (Hons.), B. Sc., (Lon.), M. R. C. V. S., delivered a lecture in connection with his discovery of the cause of Nasal Granuloma in Cattle.....We congratulate Prof. P. G. Malkani on his new findings." But when we learnt that Mr. Datta found Schistosomes in cases of Nasal Granuloma in December 1931, we duly published that fact as well in our very next issue. We do not believe in setting up any disharmony amongst such devoted workers in India. But since the fairness of our comments is evidently questioned we are prepared to defend our statement "During last year three workers in different parts of India independently found the cause of the disease to be a Schistosome."

The date of publication of any discovery is a matter of primary importance in any claim of priority. Mr. Datta's article is said to have been received for publication on 2-4-1932.

Mr. Malkani's public lecture on his discovery was on 18-2-1932 at Patna under the presidency of Mr. R. T. Davis, Principal, Bihar and Orissa Veterinary College.

Mr. Malkani's preliminary note on his discovery has appeared in the *Veterinary Record* of England in its issue dated 9-4-1932, which means that it should have left the shores of India much earlier.

When it is said that other workers have 'Confirmed' a previous finding, it does not mean that other workers have not been working at it *independently* and even *Simultaneously*. One person succeeds earlier and the others who follow and finish their findings naturally say that they have to confirm the findings of the first. But to try and cut away the ground off the feet of other workers by saying that it is "incorrect" to say that they also worked *independently and simultaneously* is—well, very unfair.

Again Experimental Transmission is a very necessary item under any research to complete the confirmation of the newly found out cause. Mr. Datta himself in his article refers to Cooper's "extensive experiments to transmit the disease artificially". Well, it is just where Mr. Rao has succeeded. When his histopathological studies agreed with the findings of other workers in the field, he proceeded a step further and confirmed the findings zoologically. Is it a sin to say so? Between December 1931 and April 1933 there was enough time for other workers to finish this experimental transmission. Perhaps they did not consider it as in any way important.

What surprises us is our contemporary's remark that "we cannot justifiably contrast Mr. Rao's work against Capt. Datta's and say of these three, one, Mr. Rao, has succeeded in producing the disease artificially". Even when it compares the work of *three* persons, it takes particular care to stress that it cannot justifiably contrast M. Rao's work against *Capt. Datta's*. It cannot be a question of "Heads I win and Tails you lose" with Capt. Datta. Or does our contemporary think that it is a sacrilege to breathe anything against what comes from the etherial heights of the Kumaun hills?

We never stinted to give Capt. Datta his due share of honour in this discovery. But to grudge others of similar honour for whatever little amount of work they have done in the same direction will be the height of injustice. We cannot be a party to it.

KHAN BAHADUR, SHIEKH NIAZ MAHAMMAD.

The happy news of the appointment of Khan Bahadur Shiekh Niaz Mahammad Sahib Bahadur as the officiating Director of the C. V. D., United Provinces in place of late Capt. Hickey, will be welcomed by all. We have written about this distinguished colleague of ours on a previous occasion. Through sheer merit and hard work he rose from the rank of a Veterinary Assistant Surgeon in 1905, to his present high position which we are sure he will fill with dignity and efficiency. We hope the Government of U. P. will give this tried and trusted servant of the crown opportunity to serve in his new capacity until his retirement. We wish our Khan Bahadur Saheb all success in his new sphere of work.

Original Articles.

THE PLACENTATION OF EQUINE TWINS.

BY

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The physiologically single equine ovum is regularly anchored near the base of the cornu upon the side of the functioning ovary. Instead of quickly developing an elongated blastoderm and later a very long chorion like the ruminant, the equine ovum remains ovoid or spheroidal, according to Bonnet [1] and Zietzschmann [9] for at least 28 days. The latter states further that in equine twin ova one becomes anchored at the base of each cornu and develops regularly without interfering with each other during the spheroidal stage. When the ova elongate and their cervical poles move toward the cervix, they meet at the fundus of the uterine body. Each ovum has equal right to contact with the entire endometrium. There is no direct proof that equine twin chorions ever fuse like the chorions of twin ruminants. They must abut against each other and the area of contact between them remains destitute of placental villi, or one of the ova invaginates into the body chorion of its mate, carrying with it a portion of the wall of the latter sac. Zietzschmann does not indicate the extent of the invagination or its significance.

We secured, in excellent condition for study, the afterbirths of a pair of equine twins carried full term. The twinning mare is a pedigreed Percheron, born May 1, 1929 at 344 days and weighed at birth 157 lbs. Her dam has produced 5 foals after 12 services. She was bred June 14,16 and 18, 1932. About 310 days later her udder

was engorged, milk escaped and her pelvic ligaments were relaxed; phenomena commonly regarded as authentic evidence that one of the twins has died. However, when the pregnancy terminated 30 days later the afterbirth of the dead fetus was firmly retained. This renders it highly probable that the dwarf had remained alive until near the date of expulsion, because retained afterbirth in the mare is regularly of very brief duration. At 328 days after her first service she gave birth to a 91 lb. colt in anterior presentation, followed 2 hours later by a 57 lb. dead male fetus in posterior presentation, succeeding which the two afterbirths came away in an adherent mass. The combined weight of the twins was 148 lbs, compared with the 157 lbs. weight of their dam at birth. The live colt was destroyed at 7 days owing to navel ill and arthritis.

When the afterbirths had been spread out flat they presented a superficial suggestion of having come from a 3 horned uterus. When a stream of water was introduced into the body chorion, 2, Fig 1, through the parturient rent at, 3, the chorion of the left cornu, 1, the body chorion of the live fetus, 2, and the commodious sac on the right in Fig. I (*b*), were completely distended and so remained after the parturient rent, 3, had been ligated. The water of distension did not escape through the mutilated right cornual sac, (*a*); the invaginated wall of the body chorion of the live fetus, 7,7, Figs. II and III, having become everted to constitute the inner wall of the large sac, while the invaginating body chorion of the dead fetus, (*b*) constituted a close-fitting cap over it. The water of distension in Fig. I was accordingly confined within the allantoic cavity of the live fetus which was intact throughout except for the rupture at, 3, through which the live, but not the dead, fetus was expelled.

In the three figures presented, the various parts of the chorion of the live fetus are indicated, by Arabic numerals and those of the dead fetus by Italic letters; the markings for all are uniform.

Fig. I. The membranes as expelled, spread out, the allantoic sac of the live fetus distended and photographed from the dorsal surface. 1. The placental side of the cornual chorion of the live fetus; *2*, placental side of body chorion of live fetus; 3, the parturient rent. (ligated in Fig. I) *a*, Mutilated remnant of the cornual chorion of the dead fetus, seen from the placental side; *b*, the everted body chorion of the dead fetus (which during pregnancy had been invaginated within the body chorion of the live fetus) seen from the amniotic side; *c*,*c*, mutilated margins of the chorion of the dead fetus where it had ruptured at the juncture of the cornual and body portions. This rupture involved two thirds to

Fig. 1. For explanation see page 86.

Fig. II. For explanation see page 87.

three fourths of the circumference of the chorionic sac, the unruptured portion being represented by, *a*. Through this rupture the dead fetus was expelled. Its navel cord did not rupture but the allantoic end pulled out of that membrane, taking with it a considerable mass of chorion with the larger allantoic vessels. A portion of the cornual chorion, estimated at two thirds of the total, was torn off and retained. Removed manually 9 hours later, it was too badly mutilated to permit restoration. The photograph shows clearly that the body chorion of the dead fetus was wholly intact and that the fetus did not escape through its walls at any point.

Fig. II. The body chorion of the dead fetus, *b*, Fig. I, with the invaginated body chorion wall of the live fetus, 7, 7, Figs. II and III, has been replaced within the primary body chorion of the live fetus, where it had been located throughout pregnancy, and a sagittal section made through the dorsal walls of the body chorion, 2, its invaginated portion, 7, 7, and the invaginating body chorion of the dead fetus, *e*.

4. The cornual chorion of the live fetus, opened to expose the amniotic side; 5, the navel cord; 6, 6, the amniotic side of the body chorion of live fetus; 7, 7, the outer or placental side of the invaginated chorionic wall, destitute of placental villi.

d. The amniotic side of the cornual chorion of the dead fetus; *e, e*, the amniotic surface of its body chorion; *f, f*, placental side of body chorion of dead fetus, destitute of placental villi; g, area throughout which the *invaginating* body chorion of the dead, and the *invaginated* wall of the live fetus were feebly adherent.

Fig. III. The feebly adherent chorions have been separated and photographed in a single camera field. The dead fetus and its membranes had undergone some dehydration and discoloration but showed no signs of approaching putrefaction. The feeble adhesions gave the impression of being due to a very mild inflammatory process. Although there was intimate contact between the endometrial or placental surfaces of the *invaginated* body wall of the live fetus and the *invaginating* body chorion of the dead one over approximately 7 square feet there was no suggestion of fusion. Apparently the fusion of equine twin chorions is essentially impossible, and must be extremely rare. This is in sharp contrast with the regular fusion in twin ruminants. Hence the dead fetus, owing to the complete incarceration of its body chorion within that of its live mate, was deprived of all placental contact within the uterine body and its functional placentation was limited to the one cornu—possibly 40% of the area available to the live fetus.

In 1927 the granddam of the twinning mare expelled dead twins at 320 days. One weighed 55 lbs., the other about 5 lbs., and was papyraceous. The 55 lb., fetus was first expelled, followed, by the membranes of both. When the membranes were examined a few hours later it was immediately seen that they belonged to twins and a search was instituted for the missing fetus. The bedding in the stall, and that which had been removed to the manure pile were carefully searched in vain. Finally, after some hours of delay and speculation as to what had occurred, the fetus was discovered lying as an inert foreign body in the uterus of the mare. The fetuses, grossly unequal in size, are elsewhere illustrated [7]. Photographs of the afterbirths were made without adequate conception of their meaning. A study of these in the light of what is shown by those now described reveals that the same principles apply. The smaller fetus had been long dead, both membranes and fetus had undergone desiccation while the larger fetus continued to grow. This naturally decreased the invagination of the body chorion of the dead, within that of the living fetus. The membranes of the larger fetus show at the point of invagination a hemispherical protrusion, devoid of placental villi, in the centre of which the desiccated chorion of the smaller fetus is adherent.

Only one other description of the afterbirths of equine twins has been found, that by Professor Stoss [6]. The mare aborted at 224 days, male twins, one weighing 25 lbs., the other 7 lbs. The latter was œdematous. At the contact point of the two chorions there were no placental tufts upon the chorion of the larger fetus over an area of one eighth of its total surface. From this area a cordiform adhesion extended to the chorion of the smaller fetus and of this membrane he significantly records "scarcely one fourth of its surface bore placental villi". Apparently Stoss had before him identically the same phenomena as we have recorded.

It thus appears that in the only three descriptions of the afterbirths of equine twins available, all are alike in principle in the relations of the two chorions. Accordingly the case which we are now able to more fully describe seems to be highly significant and to reveal the prevalent type of placentation of equine twins, and provides logical explanation for some highly interesting and important phenomena in connection with twinning.

1. *The mortality of equine twins enormously exceeds that observed in any other mammal.* Franck-Albrecht[2] cites Sabatini as observing 220 abortions among 32 twin pregnancies in the Graditz stud, but fails to say that the other 12 mares produced live foals of value. One of us (*W*) has elsewhere recorded[8] that in one year in a stud with 26 pregnant mares there were 6 twin pregnancies with one

Fig. III. For explanation see page 87.

dwarf, viable foal and five of the mares failed the next year. In the stud where the twinning mare belongs there have been 6 twin pregnancies during 23 years, from which there has been one viable individual, a dwarf mule. The twinning mares have mostly failed to again breed.

Not all twin pregnancies end so disastrously. One of us has seen a valuable pair of twin mules. In another instance a Percheron mare bore living twins, one of medium size which died promptly, the other a dwarf which grew to 50 or 60% the size of his dam. Von Oettingen[4] records a long list of valuable brood mares which produced twins in addition to a long list of valuable progeny, numerous twin mares have given a good account of themselves in the stud and on the turf and some twin stallions have done well.

The profoundly abnormal relations described in the placentation of equine twins provides adequate reasons for the ensuing mortality.

2. *Equine twins are the most grossly unequal in size of any species known.* The type of placentation above described satisfactorily explains this phenomenon. The invaginating ovum, deprived of adequate endometrial contact, inevitably becomes dwarfed and its defective nutritive supply lowers its resistance and endangers its health and life. Without chorionic fusion as in ruminants the invaginating ovum cannot obtain parasitic nutrition from its enveloping mate.

3. *The individuals of equine twins show wide variations in their power to resist disease.* In ruminants, if one of a pair of twins dies, the other almost always perishes promptly, while equine twins with separate chorions do not commonly die simultaneously. Not rarely one of them—the invaginating ovum—dies and undergoes papyraceous mummification, a phenomenon virtually unknown in ruminant twins. There are important exceptions to the prevailing rules. The invaginated or enveloping ovum is more directly exposed to infections from the cervix, so that not very rarely the dwarfed, invaginating fetus may be born viable while the larger one is weak and succumbs early. Rehse[5] reports a case in which one twin, quite certainly the enveloping one, underwent maceration and sloughed away early, the mare apparenly recovered and produced a viable foalat term, and a second case in which one twin was early aborted and the other born viable at term.

The details of twin placentation as described above are not always followed. The pair of twin mules already mentioned certainly did not develop in such manner; they could not have been born of equal size. Kitt[3] relates one case of an equine anidian monster,

which carries with it the assumption of vascular anastomosis between the pair.

Available data indicate that most equine twins are males, perhaps in the neighbourhood of 150 male fetuses to 100 females but the ratio of abortions in males, along with early deaths, serve to equalize the sex ratio and may end, when the foals are a few days old, in an excess of fillies.

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A CLINICAL STUDY OF BOVINE TWINS AND FREE-MARTINS.

BY

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The present study was made possible through the highly appreciated courtesy of Drs. Cameron[1] Fincher[2] and Udall[3] of the staff of the New York State Veterinary College, who supplied clinical materials of unusual significance, with breeding histories of the cows involved. Dr. Errington[4] added to these an instructive series of twin afterbirths from ewes and goats which furnished extremely valuable data for comparison. The basic clinical materials were in outline as follows:

Case 1. Born 1926, calved when two years old at 269 days. Re-bred at 73 days postpartum. Failed. Bred after a heat interval of 101 days. Bull calf at 283 days. Re-bred 308 days postpartum.

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(3) Professor of Veterinary Medicine and Hygiene.
(4) Instructor in Surgery.

Failed. Bred after heat interval of 25 days. Viable bull and dead free-martin at 243 days. Retained afterbirth. Re-bred 89 days postpartum. Failed. Bred after estrual interval of 82 days. Non-viable bull and dead free-martin at 230 days.

The afterbirth, Fig. 1. shows that the twins were unicornual, with a common chorion and communicating amnions. The free-martin had been located in the proximal, or cervical amnion, the bull in the distal or ovarian amnion. As indicated by a series of short bars, there was an extensive partition between the two amnions which arose from the amniotic walls between A and B, and extended across the cavity for the distance shown by the isolated strip of the partition marked x x x. The main portions of the partition were rolled into a cylinder in order to expose the interior of the amniotic cavities. The partition failed to reach the opposite side, thus leaving a crescentic opening between the two sacs. The free border of the inter-amniotic partition was covered by epithelium. The distal fetus had been expelled through the existing opening in the partition.

The vascular supply of the two ova was communal. The attending veterinarian could recognize but one corpus luteum by rectal palpation. The black-and-white color markings were not identical.

The free-martin was thickly smeared with meconium, indicating severe diarrhoea of long standing. The male fetus showed evidences of milder and more recent diarrhoea.

The traces of the abortive reproductive system of the free-martin are shown in Fig. 2.

Case 2. (a) The granddam of the genitally aberrant female abort shown in Fig. 3, was purchased pregnant and produced a non-viable bull and viable free-martin. Re-bred 98 days postpartum, produced a heifer (Case 2 b) at 279 days. Following parturition estrum had not been observed at 101 days, at which time the herdsman caused the cow to be raped. Dead bull and free-martin at 283 days. Metritis. Re-bred 211 days postpartum. Failed. Bred after heat interval of 66 days. Viable heifer at 282 days. Retained afterbirth, cervicitis, nymphomania; conceived at 10th. service; aborted at 110 days; cow destroyed.

Case 2 (b). Daughter of (a). Bred at 16 months. Failed. Bred after a heat cycle of 15 days. Bull at 279 days. Extensive placental lesions. Re-bred 90 days postpartum. Failed. Bred after heat cycle of 17 days. Failed. Bred after heat cycle of 6 days. Failed. Handled for sterility four times. A corpus luteum was dislodged at last handling. Bred after 17 days. Aborted heifer with aberrant genital tract (Fig. 3) at 217 days. Cow reacted to tuberculin; destroyed.

Case 3. First bred at 16 months. Failed. Bred after heat cycle of 18 days. Heifer at 271 days. Re-bred 69 days postpartum. Heifer at 280 days. Re-bred 99 days postpartum. Failed. Bred after heat cycle of 23 days. Failed. In estrum, not bred, after 31 days. Bred after heat cycle of 32 days. Bull and free-martin at 275 days. Bicornual twins with vascular anastomosis. Free-martin slaughtered at 83 days and aberrant genital tract illustrated at C in Fig. 4.

The cows involved are pure breds of high pedigree, all Bang—negative members of Bang-negative herds. The abortion rate in one herd for the past year was 50%; in one herd the breeding efficiency had been good, but concurrent with the beginning of these studies became extremely poor and so remains; the breeding efficiency in the third herd has been high for some years.

All four cows involved have shown great irregularity in the length of the estrual cycles. If the ideal cycle be placed at 21 days, with a variation of one day in either direction, there is no recorded heat cycle in either of the cows which fulfills the ideal.

The common domestic mammals, omitting for the present the sheep and goat, include the distinctively uniparous mare and cow and the equally pronounced multiparous sow and carnivora.

The mare has a cruciform uterus with a commodious uterine body and two cornua which leave the body at almost right angles, each of which has a cavity only slightly less than that of the body. When conception occurs, the single ovum becomes anchored near the base of the cornu corresponding to the functioning ovary and eventually occupies almost equally the gravid horn and the uterine body.

The uterus of the cow consists of two acutely conical cornua lying in immediate contact at the cervical end and diverging anteriorly toward the ovaries at an angle of 10 to 15 degrees. Technically, but not practically, there is a uterine body. The single fetus is anchored near the middle of the cornu corresponding, with the functioning ovary.

The functional uterus of multipara consists of two long, cylindrical cornua. The uterine "body" is devoid of placental function, and contains no portion of the ovum except at parturition when it serves as a portion of the birth canal. The fertilized ova become anchored at approximately equidistant points in the cornua, where they remain throughout gestation. If both cornua be healthy, and an excessive number of ova are present in one horn, some of them may, as shown by Corner[2] and others, migrate to the opposite cornu and equalize the load.

In unipara the placenta of the single ovum invests the entire endometrium; in multipara the placenta of each ovum is restricted to the ampulla or distended cornual segment in which the ovum is anchored.

Two ova do not develop side-by-side in the tubular uteri of domestic mammals. The location and placentation of bovine twins is primarily dependent upon the source of origin of the two ova. In the majority of cases one ovum comes from each ovary and is anchored in the corresponding horn to constitute bicornual twins. In a minority of cases both ova emanate from one ovary and are anchored in immediate contact in the corresponding horn to constitute unicornual twins.

During a study of the organs of reproduction of cows in abattoirs I observed 15 twin pregnancies among 1701 gravid uteri, of which 11 were bicornual, and 4 (27%) unicornual twins. This ratio agrees with the observations of Keller and Tandler [13] and is probably representative.

The method of twin or multiple placentation in ruminants regularly approaches the zoologic plan through the fusion of the two or more chorions to constitute a single sac which makes placental contact with the entire endometrium. The plan is well illustrated by the chorion of the ovine triplets shown in Fig. 6. Gilman [8] records similar relations in bovine triplets, and Ruckner [25] for quintuplets. Regardless of the number of ova, the ruminant tends to maintain the physiologic plan of uniparous placentation through the fusion of all chorions into a single sac. This plan is sometimes thwarted. Hadley (Univ. Wisconsin, personal communication) observed the birth of viable twin bulls 62 days apart. So far as known, one of a pair of twins occupying a common chorion, cannot be aborted or born without necessitating the expulsion or death of the other. It is definitely known that bicornual ruminant twins may have separate chorions; in unicornual twins separate chorions are unknown.

The arrangement and placentation of equine twins has not been extensively studied. Errington and Williams [5] show in the concurrent contribution that often, if not generally, the chorion of one equine twin becomes invaginated into that of the other throughout the uterine body area, subjecting the imprisoned twin to severely limited placental contact, deprivation of adequate nutritive supply, starvation, dwarfing and exceptionally high mortality. It is reasonably clear that such placentation is not constant, but is sufficiently prevalent to be highly significant and provide a highly interesting comparison with bovine placentation of twins.

When labour begins in multipara there is ample anatomo-physiologic provision against the advent of any conflict over right-of-way

between any two of the numerous fetuses. In the sow, the non-placental chorion of one of the proximal fetuses extends across into the opposite cornu, giving it precedence in birth. More important on the whole seems to be alternating contraction of the two cornua, so that while one is pushing its proximal fetus into the uterine portion of the birth canal, the other horn is in a state of relaxation. While the first fetus is being born all other ova remain in their assigned zones, their placental contact maintained and their lives adequately protected.

When labor begins in a uniparous domestic mammal the uterine body and two horns contract in unison and push the single fetus into the birth canal, and, physiologically it is promptly expelled. If bicornual twins are present in a domestic ruminant and the rule of chorionic fusion has prevailed, the cervical area of the common chorion is forced through the birth canal to constitute the first "waterbag", and the rent in it serves as a common exit for both fetuses. Neither fetus enjoys a right-of-way, and, in a large ratio of bovine twins the two become jammed in the birth canal, like Jacob and Esau, to constitute " twin dystocia."

Immediately after birth each multiparous young preempts one mammary gland and under physiologic condition does not attempt to take milk from another gland and no other member of the litter encroaches upon its nutrient supply. If there are more young than mammae the surplus individuals starve. If there are fewer young than mammae, the unassigned glands immediately assume a state of rest.

The singly born young of unipara takes the milk from all mammae alike, whether there be two or four glands. When twins are born there is no recognized nursing rights and it becomes a contest of strength and agility to determine the amount of milk which each may receive.

Accordingly when an uniparous mammal transgresses her law of ovulation, fixed by evolution through the ages, and simultaneously discharges two ova, there is established a conflict between the twins regarding intra-uterine position and placentation which is continued through birtn and nursing until weaning time ; a warfare unknown to multipara.

The chorionic fusion of ruminant twins and higher multiples of ova is of vital importance for maternal and fetal welfare, the value of which increases as the intimacy of the fusion advances. It equalizes the pressure of the allantoic fluid upon the contained amniotic sacs, renders the fixation of the fetuses more secure and stabilizes the placental circulation.

Bicornual bovine twins usually, and so far as known, unicornual bovine twins always develop communal circulatory systems.

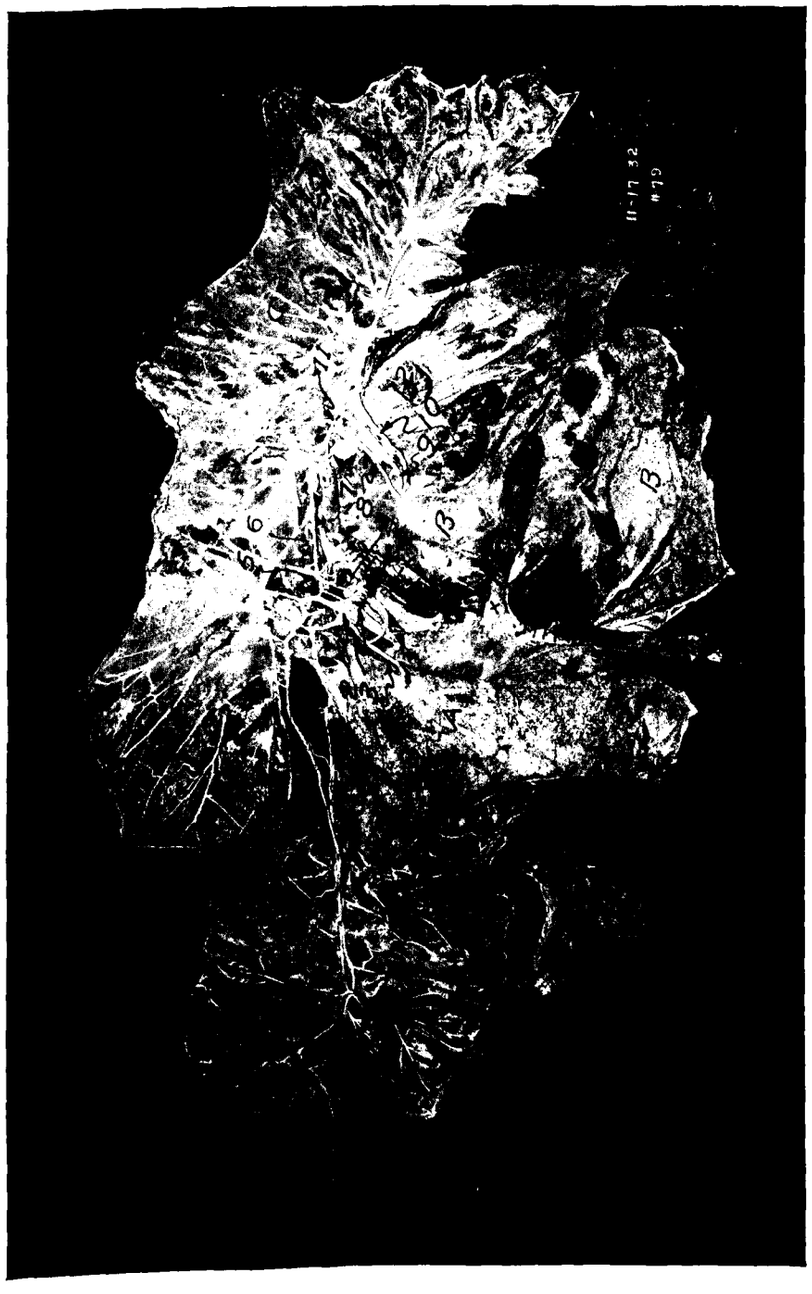

Fig. I. For explanation see page 106.

A Clinical Study of Bovine Twins and Free-martins.

Fig 2. For explanation see page 107.

The umbilic artery of each ovum which is directed toward its mate anastomoses with the other to constitute an inter-fetal arterial trunk from one navel to the other, assuring stabilization of the blood supply. This is still further assured by the commodious anastomotic arterial trunk passing from one, to the other umbilic artery of each navel as shown at 5, Fig. 1, and 3, Fig. 5, through which the arterial blood pressure is stabilized from end to end of the common chorion.

The twin, or higher multiple chorions of the sheep and goat regularly fuse as in the cow in so far as the physical union of the chorionic walls is concerned and a common allantoic sac is formed, as indicated in the ovine triplets in Fig. 6. The fusion of the vascular system, so regular in the cow, rarely occurs in the small ruminants. Keller [12] observed one case in the goat, and Rotermund [24] records one instance of limited vascular anastomosis in the ewe. As shown in Fig. 6, the point of fusion between the chorions is usually well marked. The fusion itself suggests capillary anastomosis. Sometimes arteries from each ovum are seen to enter one placental cotyledon, implying vascular anastomosis. Further clinical evidence of occasional vascular fusion is furnished by the occurrence in sheep and goats of anidian monsters, which so far as known originate from defective ova incapable of development except as parasites having vascular connection with a normal twin.

The communal vascular supply of bovine twins evidently tends to equalize the size and vigor of the young. Unfortunately, records are wanting regarding the relative sizes of bovine twins and triplets. The clinical impression is that bovine twins are far more alike in size than are the twins of any other domestic mammal. In marked contrast, the triplet lambs, Fig. 6, weighed 5·8, 3·3, and 7·0 lbs., respectively the smallest weighing 47·1% as much as the largest. Fig. 6 shows that the two larger ova appropriated a great preponderance of the placental area and the smallest fetus was denied adequate nutritive supply. In the same flock one of a pair of twins weighed 5·6 lbs., the other 4·8 lbs. In both the triplets and twins the weights of the individual lambs were in accurate harmony with the available placental area.

In a vast majority of equine twins there is great inequality of size, evidently due in many, if not most cases to the deprivation of adequate placental contact of the smaller ovum through the invagination of its chorion into the sac of the larger twin, as described by Errington and Williams [5].

The size of the young of a multiparous litter is well regulated by the independent placentation, but is often disturbed by disease of

individual ova which may not importantly affect the health or growth of other ova.

It may therefore be stated as a basic principle that the relative sizes of the individual members of twins and triplets and higher multiples of young in unipara is dependent upon the ability of the given species to adjust the available nutritive supply to the abnormal number of young concerned. Equine twins, owing to poor adjustment of the vascular supply, are the most unequal in size known amongst mammals, while at the other extreme, bovine twins, thanks to the communal vascular system, provides the greatest uniformity in size observed in domestic mammals.

The health and vigor of twin ova, as well as the size, is profoundly affected by the placentation. The appalling mortality of equine twins, as shown by Errington and Williams [5] appears to be due primarily to the failure of proper adjustment in placentation and consequent absence of adequate nutrition.

On the other hand, bovine twins are usually of similar health and vigor. If one dies in utero the other also usually perishes. Many bovine twins die young, but as a rule both of the pair fare alike. In ovine twins the death of one in utero is usually followed shortly by the death of the other. After birth, the smaller, inadequately nourished lamb often dies young without prejudice to its larger mate. Thus in the triplets, Fig. 6, the 3·3 lb. lamb died promptly as did also the 4·8 lb. lamb of the twins mentioned.

Twins in small ruminants are regularly bicornual, in sharp contrast to the occurrence of 27% of unicornual twins in the cow. Rotermund [24] studied 14 cases, all of which were bicornual. I have studied about 50 pairs of twins in sheep and goat without seeing unicornual twins. The prevalence of unicornual bovine twins indicates that in cattle there is a far poorer stabilization of twin ovulation than in the small ruminants; that is, the higher the ratio of unicornual twins, the more definitely pathologic the ovulation. In all three cases upon which this paper is based, each cow showed gross irregularities in estrum, closely akin, clinically, to nymphomania. Sheep and goats are not known to suffer greatly from irregular heat cycles and nymphomania is virtually unknown. In the nymphomaniac cow there frequently occur two or three cysts in one ovary while the other is free. The observations of Lothe [20] and others indicate that twin ovulation and nymphomania are intimately related, and it logically follows that twin ovulation, like multiple nymphomaniac cysts may frequently emanate from one ovary. Data are not available but it is probable that the mortality and the ratio of free-martins is higher in unicornual, than in bicornual twins.

In the ewe and goat almost, if not all twins are bicornual. Thomas [30] records that in the ewe the mortality of young for the singles was 0, for twins 9% and for triplets 25%. When triplets occur, Fig. 6, two ova are necessarily anchored in one horn and the mortality rises abruptly, wholly out of proportion to the increase of the nutritive load.

Some writers contend, either directly or by inference, that bovine twins are due to *heredity* and are therefore not *pathologic*. Apparently they regard hereditary phenomena as obligatorily physiologic. That is in conflict with clinical experience. The group of incestuously bred heifers recorded by Fincher and Williams [7], of which 69·5% were sterile, unquestionably owed their sterility to defects in the reproductive cells existing prior to fertilization; the sterility was *hereditary* and *pathologic*. If the zoologic law of uniparous reproduction be stretched to include bovine twins as physiologic, it inevitably follows that bovine triplets are physiologic and there remains no defensible limit to the number of ova which a cow may produce at one ovulation period, including as physiologic the sixteen fetuses recorded in a cow by Kleinschmidt [16]. Johansson [11] discerns no evidence of disease as a *cause* of twinning but admits that twinning *causes* such diseases as abortion, sterility and retained afterbirth. As a rule, any important disease of a sexual organ disturbs the equilibrium of the entire reproductive system. Occasionally the disturbance may be largely confined to the ovaries and be revealed in the form of twin ovulation, while the other organs of the reproductive system remain sufficiently healthy to produce approximately normal twins or even triplets or quadruplets. These phenomena lead sometimes to the inference that they are evidences of exalted fertility. Such is not the rule. McIntosh [22] records a good illustration. A cow, after having produced 4 singles, aborted triplets at 3 months, quickly followed by a second triplet abortion and two twin abortions, giving a total of 10 aborts in 20 months, where her record terminates without showing that she later produced live young.

Twin abortion is commonly ascribed to the overdistension of the uterus. Clinically this is not true, or dropsy of the amnion and allantois would automatically correct itself through abortion. Instead it causes one of the most discouraging types of dystocia, commonly resulting in the death of both mother and young and the phyiscal exhaustion of the obstetrist. Even twins and dropsy combined did not cause abortion in Fincher's case [6], and he failed to save either mother or young.

If overdistension of the uterus were a fertile cause of abortion, the sow should prove the hypothesis beyond dispute. Carmichael and

Rice [1], record that in 357 1-8 pig litters the average litter weight was 15·75 lbs. and in 288 9-20 pig litters 26·39 lbs. The duration of pregnancy was 1·11 days greater for the first group. The dead and non-viable young in the first group was 7·7%, in the latter 10·5%. It cannot be maintained that the physiologic number of porcine young ranges from 1—20 inclusive. If the number of mammae be accepted as the criterion for the physiologic number of pigs in a litter, the average should fall between 10 and 12. Applying this criterion to the statistics of Carmichael and Rice it is found that the ratio of dead and non-viable young rises to 12 to 25% in the 1, 2, 13, 14, 18 and 20—pig litters, thus indicating that in the sow the greater the departure of the number of ova in either direction from the zoologic plan, the higher the mortality of the young.

I have elsewhere submitted extended evidence [32,34] that twinning in cattle is pathologic. Stoss [28] has submitted valuable data in support of this view; Wagner [31] indirectly shows that in a highly sterile group of cows, twinning was excessive; and Lothe [20] shows that cows suffering from nymphomania show a remarkable ratio of twins when they conceive early after the cessation of cystic degeneration. In the large herd elsewhere cited, [32,34] among 20 twinning cows with 22 pairs of twins, 7 twinnings occurred in first pregnancy. Two of these were pasture bred; the other 5 required 2—3 copulations each, with but one ideal heat cycle among them all. Six of the pluripara conceived at first service 26 to 54 days postpartum, apparently the first estrum. Two twinnings occurred in the next pregnancy after abortion or stillbirth. Five twinnings occurred in pluripara which were slow to conceive and required an average of 4 services each. Thus in 18 of 22 twinnings there was a background of clinically evident disease, or conception occurred too early following parturition for stabilization of ovulation to have been expected. In outline the 22 twinnings reveal: 1st pregnancy, 7; 2nd pregnancy, 4; later pregnancies, 11.

Heifer calves	12=27·3%	Viable	10=83·3%
Bull ,,	24=54·5%	,,	15=62·5%
Free-martins	8=18·2%	,,	4=50·0%

Five (25%) of the twinning cows died or were destroyed sterile without again having become pregnant. The unusually high ratio of twins in the first and second pregnancies was quite certainly due to the fact that a large group of heifers had been erroneously handled during their milk feeding period, resulting in sub-normal growth, low vigour and a marked repression in the development of the reproductive system, leading to juvenile genital organs, with much sterility, abortion, stillbirth and dystocia.

A Clinical Study of Bovine Twins and Free-martins.

Fig. 3. For explanation see page 107.

Fig. 4. For explanation see page 107.

The Etiology of Free-martins.

The problem of the origin of the free-martin has given rise to various hypotheses. In 1917, Lillie [19] and Keller and Tandler [13], after extended and brilliant investigations, reached the conclusion that the free-martin is a female ovum, co-twin with a bull; the chorions of the twins fuse, vascular anastomosis occurs, the male ovum produces a sex hormone which passing through the anastomosed vessels, reaches the female ovum and inhibits the development of the reproductive system. This hypothesis has been generally accepted. Further studies seem to justify a proposal to modify this hypothesis and to endeavour to fit in and correlate twinning and free-martins as an integral part of a comprehensive mosaic of the pathology of reproduction.

The conclusions of Lille and Keller and Tandler are based upon two important hypotheses: *a*, the fertilized ovum which is ultimately to become a free-martin is a female, and *b*, the male twin ovum produces a potent sex hormone which regularly inhibits the development of the female genitalia.

a. It has not been shown that the free-martin ovum possessed, at any period of its existence, reproductive organs of either sex, or had the elements required for the evolutions of sexual organs. In the typical free-martin, Figs. 2 and 6, there is a small tissue mass located approximately where the ovary should be. Macroscopically there is nothing which enables the clinician to determine the sex. Histologically neither ova nor spermatozoa are recognizable. Lillie [18] says "the internal anatomy is so definitely male in its main characteristics that anatomists have frequently classed the free-martin as a male individual, contrary to the ordinary common sense interpretation of its sex," and that "the external characters are usually typically female." The urinary opening of the free-martin is an elongated slit in the perinaeum in the location where the vulva of the heifer normally develops. The slit is longer and narrower than that of the heifer, as shown in Figs. 2 and 6. The opening of the vulva of the heifer is backward and slightly upward; the urinary slit of the free-martin opens almost directly upward. An inconspicuous clitoris is located along the floor of the heifer vulva, and becomes conspicuous as puberty is approached; the urinary slit of the free-martin has a large, conspicuous phallus, without close resemblance to clitoris or penis. The vulvar tuft of the heifer usually has an abundance of short, fine hairs; the hairs surrounding the urinary slit of the free-martin are usually comparatively few in numbers and long and coarse, approaching in appearance the preputial tuft of the bull. When a heifer urinates, she arches her back, spreads her hind feet

apart, crouches, and the urinary stream is directed backward and downward ; when the free-martin urinates, according to very limited observation, it elevates the tail and depresses the spinal column, does not crouch and the urinary stream is directed upward and backward.

At the age when bulls and heifers acquire sexual characteristics the free-martin takes on unique appearances so difficult of description that writers evade the task by futile comparisons with heifers or castrates of either sex. The free-martin, without demands upon its nutritive supply for the development of a reproductive system, grows rapidly, is long-legged, coarse, and devoid of sex characteristics in form, size, voice, behaviour, facial expression, growth of horns and otherwise. The anterior part of the body, the ears, horns and facial characters are well illustrated by Hutt [10] in his group photograph of quadruplets at 7½ months, comprising a bull, a free-martin and two heifers. According to my observations an adult free-martin is readily and authentically recognizable at a glance even when in a group of several hundred cows with its complement of breeding bulls.

Lillie [19] contends that the free-martin must be classed as a heifer because otherwise the hypothetic sex ratio is grossly upset. I have elsewhere submitted extensive data [32,34] showing that in dairy herds where genital disease is rampant, the expected sex ratio is profoundly disturbed with a great preponderance of bulls. It has long been common knowledge that aborts and stillbirths are predominantly males, indicating that in a diseased female, a male conception is more probable, and inseparably, the pregnancy is less secure.

(*b*) The hypothesis that the free-martin is caused by the action of male sex hormones upon a female ovum is incapable of proof : it is not known that the male ovum secretes a sex hormone at the period involved.

It is not essential that a free-martin be a co-twin with a bull. Wagner [31] authentically records a free-martin which was co-twin with a fertile heifer. These cases are perhaps not rare but heifers are so often sterile, and the differenciation between heifers and free-martins has been allowed to remain so obscure, that numerous free-martins born co-twins with heifers may readily be discarded as sterile heifers.

Hermaphrodites or intersexuals supply convincing evidence that male ova do not secrete sex hormones which inhibit the evolution of the female reproductive system. Hermaphrodites of every conceivable variety are common to all domestic mammals. If chorionic fusion and vascular anastomosis of two-sexed twins inhibits the development

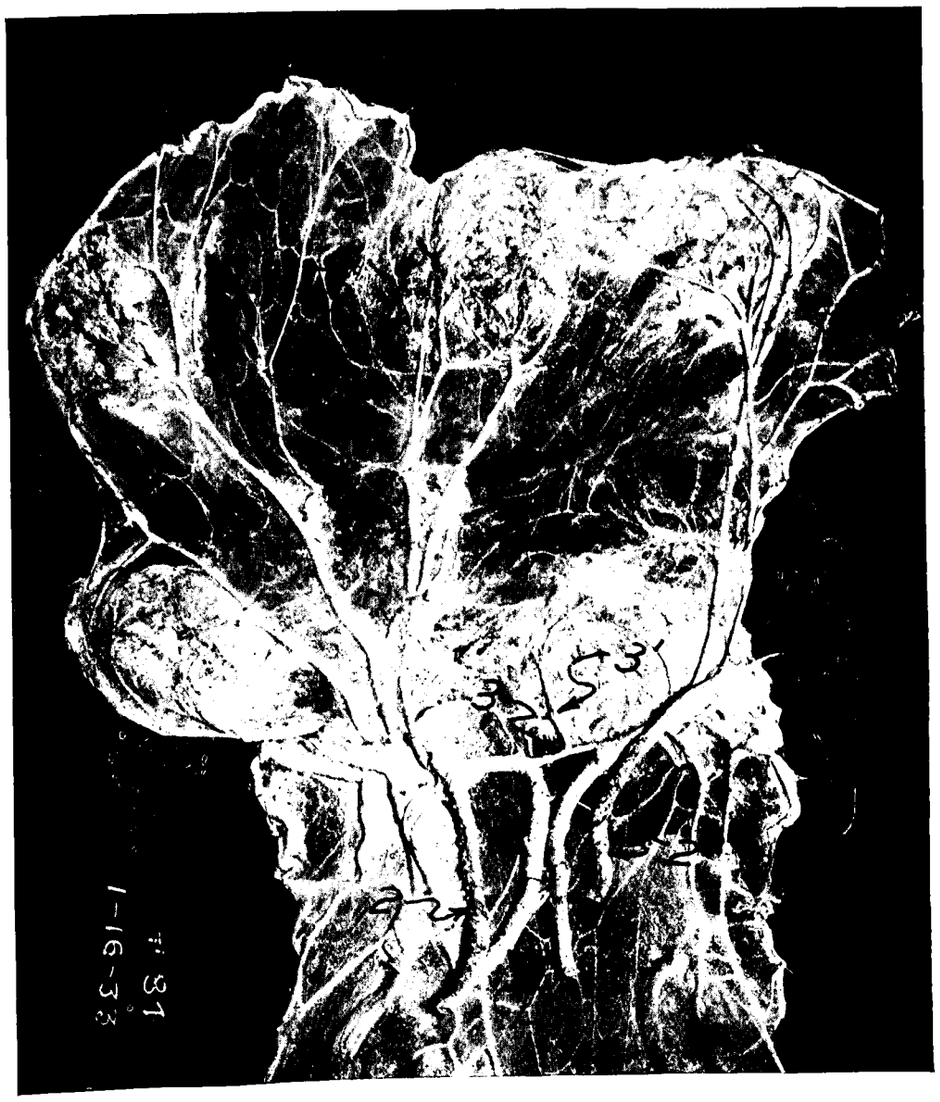

Fig. 5. For explanation see page 107.

Fig. 6. For explanation see page 107.

of the female reproductive system, hermaphrodites automatically become impossible. Kitt [15] describes an extensive list of hermaphrodites in all domestic mammals, in endless variety. Hermaphrodites are usually infertile, but when fertile, contrary to the free-martin hypothesis of Lillie [18] and Keller and Tandler [13] it is regularly female, not male fertility. Kitt [15] cites *Z*schokke as having observed a bovine animal with testicles "the size of a fist" which had given birth to several calves. Gurlt [9] cites Scriba as having observed an hermaphrodite which exhibited sexual desires of both male and female. I removed two large testicles from an equine hermaphrodite through a vaginal incision as in spaying a mare. The fully developed uterus and vagina reacted to the operative procedure the same as a mare. The animal had the perverted sexual desire of a cryptorchid stallion, to overcome which the operation was performed. The presence of large testes had not interfered in the least with the development of uterus and vagina. Kingsbury [14], Corner [3] and others record the development of both testes and ovaries in swine, and in the latter case, the ovary, not the testis functioned.

Anidian monsters like Fig. 8, are uniformly asexual. If the absence of the reproductive system in free-martins be due to male hormones reaching the ovum from the male twin, it is quite as logical to assume that the sexlessness of anidian monsters is due to the same cause. Such conclusion would create a temptation to invoke the blighting influence of hormones produced by the host ovum as inhibiting the formation of the heart, the head and the tail of the monster.

The proposed modification of the Lillie and Keller and Tandler hypothesis is that the free-martin is the product of an imperfect twin ovum, discharged by a diseased ovary. The defective ovum is incapable of independent development but may live as a parasite upon a sex-potent ovum in any mammal where fusion of the two chorions may occur and vascular anastomoses become established. This is by far most readily accomplished in the cow. Keller [12] describes a case in the goat and it probably occurs in sheep.

In multipara, in which the fertilized ova are anchored at approximately equidistant points, each wholly independent, effective chorionic fusion is almost impossible. Hence it occurs that monsters which are so ultra-primitive that they can only live as parasites upon normal ova are virtually confined to unipara which have violated their zoologic law and shed two or more ova during one estrum. The only such monster in a multiparis mammal found on record is one instance in a cat, reported by Kitt [15]. Many fertilized ova [illegible] to perish in the sow. Probably many of these death [illegible] of defective ova, incapable of independent development and [illegible] to establish

vascular relations with normal ova where they may live parasitically. In single ova of unipara, sexless individuals are unknown. They probably occur frequently, but in the absence of a sex-potent twin with which they may fuse, die before gestation is recognizable. Perhaps the nearest recognizable approach to such a monster is the cystic mole, Fig. 8. An ovum was fertilized, the prochorion formed, and persisted for months but no macroscopically recognizable embryo formed.

The proposed hypothesis recognizes the occurrence of disease of the ovum prior to its escape from the ovisac. This is well attested clinically by Fincher and Williams[7] wherein 69·5% of a group of incestuously bred heifers were anatomically sterile. The proposed theory permits of the formation of a definite chain of the antenatal pathology of the reproductive system as follows :

ORDER I

Asexual monsters incapable of intrauterine development except as a parasite by fusion with a sex-potent ovum. Confined to unipara. 1. Ultra-primitive monsters which cannot be born alive but perish immediately when separated from the host ovum. Anidian monsters. *Amorphus globosus* (Gurlt). 2. Free-martins. Viable.

ORDER II

Reproductive system present, with sexul desire but sterile (with extremely rare exceptions) because of basic defects in the sexual organs. Common to all domestic mammals. May develop independently. Viable. 1. Hermaphrodites. 2. Atresia of the ducts of Muller (Fincher and Williams [7] cases). 3. Persistent hymen (Fig. 4). Bilateral cryptorchidy, etc.

ORDER III

Defective reproductive organs which jeopardize, but not necessarily inhibit reproduction. Common to all domestic mammals. 1. Unilateral cryptorchidy. 2. Double uterus. 3. Uterus unicornis, etc.

ORDER IV

Physiologic reproduction.

Some teratologists dissent from the above classification and attribute the anidian monsters of Order I to unequal fission of a single ovum. Uniovular twins are not definitely known to occur in domestic mammals. Granting the possibility, this ultraprimitive type of monster, should, if caused by unequal fission, be as common in multipara as in unipara. It is difficult to conceive of such a monster as that shown in Fig. 7 upon the theory that it is due to

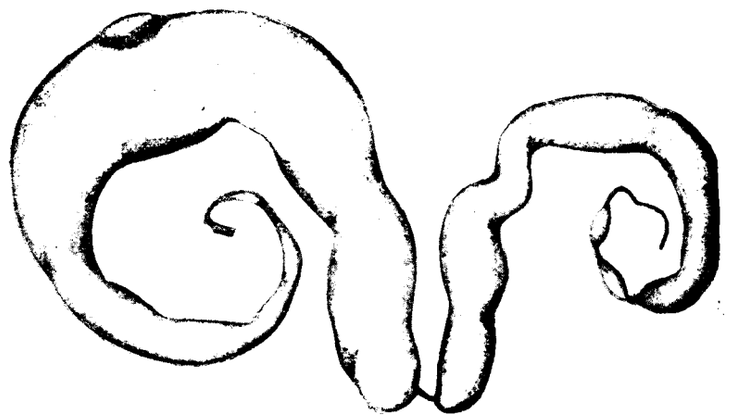

Fig. 7. For explanation see page 107.

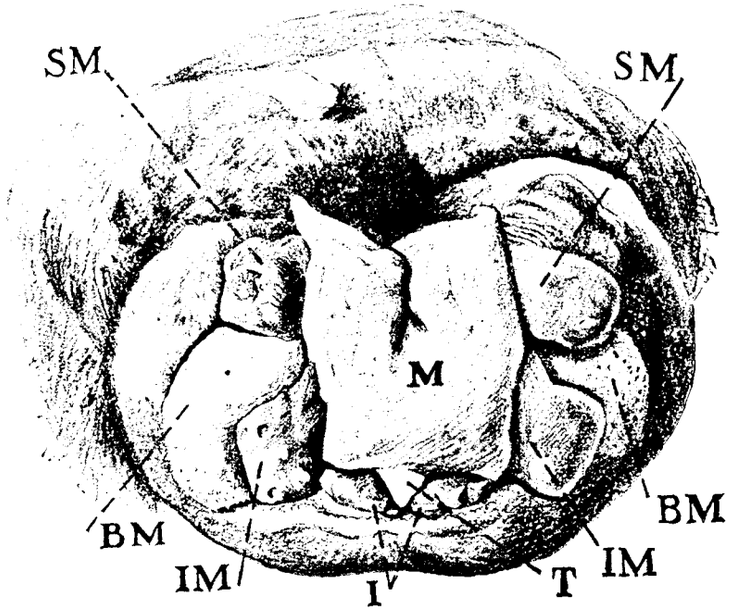

Fig. 8. For explanation see page 107.

unequal fission of a single ovum but quite understandable as a sexless, amorphous ovum, non-viable except as a parasite upon a normal twin. This is supported by the observation of Conklin (Macdonald College, Quebec). A cow suffered from nymphomania, recovered and conceived. Conklin diagnosed twin pregnancy and the cow produced a single, vigorous calf. A photograph of the afterbirth plainly shows an *Amorphus globosus* (Gurlt) still attached in the cornu of the afterbirth opposite to that in which the normal fetus had developed, indisputably showing that the monster was one of bicornual twins. Had they been unicornual twins the theory of unequal fission would have seemed more plausible. The monster weighed about 9 lbs., was covered with heavily-haired skin with the interior consisting of connective tissue. Frequently these monsters weigh but a few ounces and appear as a ball of hair. Gurlt[9] observed a century ago that anidian monsters are sexless and that the reproductive organs of monsters are generally defective. I have elsewhere shown[36] that in a considerable list of monsters, predominantly males, a vast majority of both sexes had defective genital systems.

The Economic Problem of Bovine Twins.

Bovine twins are of great economic importance in the dairy breeds. Usually the ratio of twins in a herd parallels the sterility-abortion-stillbirth losses. This is well supported by a careful analysis of Johansson's[11] Tables 3, 4 and 21. The higher the ratio of twins in a herd the higher the rate of mortality of twinning cows and of the twins. At times this rule appears to be vacated or reversed, especially when but few animals are involved and but a brief space of time covered. In the large herd mentioned on page 11, amongst 44 individual twins there were 10 viable heifer calves to offset the loss of 5 twinning cows. The twin heifers are subnormal in size and those which have reached breeding age have been of low or moderate efficiency. Among the 5 pairs of twins mentioned in the basic cases of this paper, no viable heifer was born; cows 2 (a) and (b) have been destroyed and the fertility of the other two is undetermined. In the McIntosh case[22] described on page 10 there were produced 10 aborts in 20 months and there is no record of producing any calves later. Lubbehusen, Fitch and Boyd[21] record that after injecting virulently pathogenic live Bang's bacilli into 27 non-pregnant heifers, 3 (11 %) conceived twins. The value of the twins is not recorded; all 3 cows were lost. In addition to the recorded observations of Lothe[20] showing a twin ratio of 60% in conceptions occurring early after apparent recovery from nymphomania, a personal communication advises that in the herd named, among 15 twin pregnancies there were 3 definitely recognized viable heifers and

three dead cows. Despite the exceptional cases where healthy, valuable twin calves are born without recognizable injury to the cow, and receive much publicity, when the actual results are carefully tabulated for a herd over a considerable period of time, the available data indicate that twinning is an expensive disaster.

Passing beyond twins, no record has been found where a heifer calf, born as one of triplets or higher multiple of bovine young, has proved fertile. Triplet lambs largely die young. In the flocks of the N. Y. State Agricultural College, some ewes, born as triplets have produced lambs. Curson[4] and Hutt[10] record that heifers born as members of quadruplets, developed estrum and were bred, all unsuccessfully, apparently owing to defective reproductive organs. The higher the multiple of young in unipara the greater the mortality of mother and progeny and the lower the fertility of the viable young.

The Control of Bovine Twins and Free-martins,

Twinning falls definitely within the field of practical control. In the preceding pages data have been submitted indicating 3 important causes of twinning, all of which are subject to practical elimination. 1. The improper handling of dairy calves during the milk-feeding period, resulting in retardation of genital development, associated with subnormal general growth and health, the heifers arriving at breeding age with juvenile reproductive organs. 2. The postpartum re-breeding of cows too early, before the reproductive system is able to regain its equilibrium. 3. The breeding of cows in the presence of clinically recognizable ovarian disease, irregular heat cycles, nymphomania. When the owners of the cows described at the beginning of this paper, bred them under the conditions named, they were urgently inviting disaster and got it promptly. The same may well be said of the cases of McIntosh[22] and of Lubbehusen, Fitch anp Boyd[21] already discussed above.

A careful study of bovine twins supplies a clear and forcible plea for conservativism, prudence and common sense in animal breeding. Bulletins enthusiastically teach the dairyman how very cheaply he may raise a calf on this or that food and fails to show him what, if anything it may be worth at breeding age.

Once twinning has become an accomplished fact, opinion varies as to what course should be pursued with the cow and her twins. McGillivray[23] would apparently encourage twinning and try to establish a biparous breed of cattle, others would discard mother and young. A majority of twinning cows are definitely damaged, conception is delayed or impossible, pregnancy insecure and the breeding life abbreviated. If the twin gestation has been of favourable

duration and the cow has not suffered from retained afterbirth or other serious disease, there is reasonable prospect, that with adequate rest and attention, she may breed satisfactorily.

Free-martins are regularly differentiable from heifers at birth as indicated on page 13. When the animal reaches a size permitting rectal palpation, the diagnosis may be authentically made. Estrum is wanting. The method of disposal offers no difficulty.

The supply of sires is so far in excess of the needs that there is no logical reason for the retention of twin bulls, regularly born prematurely and of deficient quality and vigour, as breeding animals.

Twin heifers commonly have a longer, more normal duration of pregnancy than bulls, their dams suffer less from retained afterbirth, the heifers are comparatively larger and more vigorous at birth. In the large herd repeatedly cited, the average duration of pregnancy for bulls was 274, and for heifers 278·7 days. A large proportion of twin heifers may breed satisfactorily.

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ILLUSTRATIONS.

Fig. 1. Afterbirth from unicornual twins with communicating amnions from Case 1. A. Proximal or cervical amniotic cavity ; B. B, distal or ovarian amniotic sac ;—the incomplete partition between the two amniotic sacs, tightly rolled from the free edge to its point of fixation in order to expose the interior of the sacs ; x, x, x, x, a strip freed by incision from the preceeding and laid against the interior of the distal amniotic sac to show the extent of the partition. The strip measures 2×15 inches. ;....., margins of the amniotic sacs where they become continuous with chorion ; C, C, allantoic sac of gravid cornu ; D, do. of non-gravid horn ; 1, large umbilic vein of proximal fetus ; 2, large umbilic artery do.;

3, arrested umbilic artery ; 4, arrested umbilic vein, a portion of which crosses over 6 ; 5, the normal anastomotic artery connecting the two umbilical arteries ; 6, 6, arterial trunk connecting the navels of the two fetuses ; 7, median umbilic vein of distal fetus, crossing over 6 ; 8, median umbilic artery ; 9, distal umbilic artery ; 10, distal umbilic vein ; 11, normal inter-arterial anastomosis. The vessels 2, 5, 6, 9 and 11 provide a direct arterial trunk from the ovarian extremity of one horn to the ovarian end of the other ; 12, 12, 12, fetal cotyledons showing through the amnion.

Fig. 2. Vestigal reproductive tract of free-martin from Case 1. 1, Gonads : 2, urinary bladder ; 3, Wolffian body ; 5, uterine cornua ; 6, Wolffian ducts ; 7, ureter ; 8, 8, seminal vesicles ; 9, excretory duct, vasa-deferentia ; 10, urethra with sound ; 11, urinary sinus ; 12, phalllus ; 13, urinary tuft of hairs.

Fig. 3. Genital tract of heifer abort from Case 2 (b), at 217 days. (Compare size and form with Fig. 2) I, ovary ; 2, oviduct ; 3, left uterine cornu ; 4, left horn, opened to show caruncles ; 5, vagina ; 6, Gaertner's ducts ; 7, atresia of Mueller's ducts (persistent hymen) ; 8, urethra ; 9, vulva ; 10, depression marking site of clitoris ; 12, vulvar tuft.

Fig. 4. Reproductive tracts from: A. An abattoir heifer fetus est. at 7 mos.; B, genital tract of heifer calf at 122 days ; C, genital tract of free-martin from Case 3 at 83 days. Photographed in a single camera field for comparative sizes. 1, Ovary or gonad ; 2, unopened uterine cornu ; 3, opened cornu, showing in A and B the uterine caruncles, in C their absence ; 4, cervix ; 5, vagina ; 6, clitoris (in free-martin the phallus) ; 7, vulvar, or urinary tuft.

Fig. 5. Navel area of allantois of cow, showing anastomosis of allantoic arteries. 1, 1, Umbilic arteries ; 2, 2. umbilic veins ; 3, inter-arterial anastomosis (regular in cow, occasional in sheep and goat) ; 3', cotyledonal trunk from 3.

Fig. 6. Fused chorions of triplets, ewe, to show absence of anastomosis of vascular systems of fetuses. 1. 1. Chorion of 5.8 lb. lamb ; 2, chorion 3.3 lb. lamb. ; 4, 4, fusion lines between chorions ; 5, parturient rent in chorion of 2, serving as common exit for all three lambs.

Fig. 7. Cystic mole. Cow, 200 days post coitum. Cyst 46 inches long, 7 inches circumference. At thickest portion of cyst, an elevation suggest the location of a non-viable embryo.

Fig. 8. Anidian monster. *Amorphus globosis* (Gurlt). Cow. Anterior view, navel at opposite end. Median longitudinal section 7×9 inches. M, Muzzle ; SM, superior maxilla, showing white denticles ; IM, inferior maxilla, showing traces of grinders ; BM, papillary buccal mucosa ; T, tongue ; I, incisors. Upon section there are traces of lungs, stomachs and unidentified bones. No evidences of brain, heart or reproductive organs. (*Museum New York Veterinary College*).

CALOTROPIS PROCERA AND CALOTROPIS GIGANTEA.

BY

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INTRODUCTION.

A few books have been written on indigenous drugs by medical men in India and fewer still on the drugs used in Veterinary Medicine. Even in these, most of the matter is either a translation of old literature, or hearsay evidence about the uses of the drugs obtained from laymen and quacks. In certain cases, medical practitioners have described the actions of drugs which, in their experience, have been found useful in practice and there are just a few which have been investigated into on modern scientific lines. Observations based on a few clinical cases are however not reliable, as some diseases are cured by nature, independent of the administration of any medicine and the particular drug used may be given credit which is unjustified without experimental knowledge of its action, it may prove harmful or even fatal in certain cases. In India such effects are not uncommon both amongst human beings and animals in the hands of quacks.

Experimental Pharmacology helps to overcome these difficulties. The physiological action of a drug is first studied on healthy animals. Its actions are further studied on various organs in small animals like the dog, cat, etc., with the help of delicate apparatus such as the kymograph.

In the light of tracings thus recorded and other experimental data similarly obtained, a drug can be used with safety and confidence in the treatment of certain diseases. In this way many indigenous drugs having a false reputation may be discarded and useful ones introduced in medicine.

Research work on indigenous drugs is a necessity especially in the veterinary profession for the following reasons :—

Firstly, economy is a great consideration in these days of financial depression and especially in veterinary practice, where the medicines used in the treatment of animals are given in ounces and pounds. Research work on indigenous drugs not only eliminates waste but allows of efficacious country drugs being procurable at the mere cost of collection or at a nominal cost from the bazaar.

Secondly, in the villages where allopathic drugs are not available, cheap country medicine can easily be substituted in the treatment of animals.

Thirdly, in the outbreak of epizootic diseases, hundreds of animals get affected at a time and treatment with allopathic drugs is very expensive. There the use of efficacious indigenous drugs helps to solve the economic difficulty. They are less expensive and easily available.

Fourthly, the results of original research in Pharmacology performed on animals may prove unreliable when applied to human beings but in veterinary work the very animals to be treated are those used in experimental work and the experiment results obtained are thus much more real and reliable.

There is no doubt that the methods of collecting drugs, their storage and preservation in the hands of shop keepers are defective and render many of them useless for medicinal purposes. This can be immensely improved by collecting the drugs at their proper season and time, and preserving them as tinctures, extracts, etc., which delays deterioration of the drugs and preserves the active properties for a considerable time.

(Calotropis Procera (*N. O.*—Asclepiadeæ) is believed by some to be a different variety from the Gigantea, but the medicinal properties are the same.)

Synonym :—Sanskrit:—Arka, Alark, Surya-puttra. (The leaves of plant were used in sun worship in vedic times hence it is called Surya-puttra or sun leaf) Sanskrit writers mention two varieties founded upon the colour of the flowers namely white, called Alark and red called Arka. English.—Gigantic Swallowwort; Mudar.

Hind.—Madar. Ben.—Akanda. Pers.—Khark. Guz.—Akado. Mah.—Ruvi; Akda. Tel.—Ekke; Jilledu; Arkamu. Tam.—Badabadam; Erukku. Can.—Ekkemale. Mal.—Erikka. Sind.—Byclospa.

History.

The ancient name of the plant occurs in Vedic literature as Arka. From one of the Sanskrit names of the plant, namely Mandarah, Madar is a corruption.

Calotropis Gigantea was first described and figured by Rheeda and an accurate and detailed description was given by Roxburgh at the beginning of the 19th Century under the name Asclepias Gigantea.

Robert Brown subsequently showed that it was incorrect to describe this plant as Asclepias, and he founded the genus Calotropis. Calotropis Procera was first described from a specimen collected in Egypt by Prosper Alpinus and figured by him on his return to Italy.

Botanical and sensory characters.

A middle sized shrub, young parts covered with appressed white tomentum; bark pale. Leaves subsessile, opposite broad, obovate or oblong, acute or acuminate, base cordate, cottony beneath. Flowers medium sized, simple or compound, arranged in axillary or subterminal, pedunculate, corolla ½ to 1 inch across, dull-purple or purplish-lilac, or white in colour.

Root-bark.—The outer surface is yellowish grey, soft and corky, fissured longitudinally and can be easily separated from the middle cortical layer, which is white and friable. The taste is mucilaginous, bitter and acrid and the odour peculiar.

Seeds:—Ovate 1/4 inch long with a bright, silk white coma.

Parts used in medicine:—Root-bark, flowers, milky juice and leaves. The part mostly used is the root-bark.

Collection.

The roots should be collected in the month of April and May from sandy soil. The older plants should be selected for the collection of the roots as the older the plant the more active is the bark in its effects. The roots thus collected should be washed to remove particles of sand and dirt and dried in the open air without exposure to sun, until the milky juice contained in them becomes so far dried that it ceases to flow on incisions being made. The bark is carefully removed dried and reduced to a fine powder.

Chemical Composition.

Dr. Warden analysing the root bark at Berlin obtained white masses of crystals and a yellow resin which were found to agree, as regards their melting point and behaviour with solvents with Alban and Fluavil respectively obtained from Gutta-percha by Payen and they were accordingly named Madar Alban and Madar Fluavil. He also separated from the drug a yellow bitter resin which is probably the active principle. Dr. E. G. Hill and A. R. Serkar analysed the root bark and have published the result in the journal of Chemical Society 1915.

The following is the summary of the results obtained from the quantitative analysis of the powdered bark:—

	Young plant.	Old plant.
Moisture	12·1	10·2
Spirit extract	15·0	16·2
Sol. in water	7·2	7·5
Resins	7·8	8.7
Total ash	7·0	12·2
Sand	2·8	7·2
Pure ash	4·2	5·0

It is clear from the above-mentioned analysis that the root-bark from the older plants has a higher percentage of acrid and bitter resinous matter than that from the younger plants. No alkaloid could be isolated so far from the plant.

Preparations:—The roots are collected from a sandy soil in the month of May and the bark is peeled off and dried according to the instructions mentioned above.

The dried bark reduced to powder No. 20 and the following preparations prepared:—

Tincture.

1. Calotropis root-bark No. 20 ... 100 Grams.
   Alcohol 90% sufficient to produce ... 1000 c.c.
   Prepared by the process of percolation.
2. Calotropis root-bark No. 20 ... 100 Grams.
   Alcohol 90% sufficient to produce ... 1000 c.c.
   Prepared by the process of maceration. (Macerated for a period of a week).

Alcoholic sat. sol. of Calotropis Juice ...

Mix Alcohol 90% to the equal volume of Calotropis juice and shake thoroughly well. Keep on shaking four or five times a day for a week. Allow it to stand for a few hours and decant the saturated solution of the juice.

THE ACTION OF DRUG ON FROG.

A rana frog weighing 37 grams was injected with an alcoholic sat. sol. of the juice into the anterior lymph sac and the frog showed the following symptoms :—

The respirations became infrequent 20 minutes after the injection. The frog was disinclined to move and there were occasional convulsions in the hind legs. It lay motionless and died an hour after the injection. The heart stopped in systole and was irritable to mechanical and electrical stimuli. Pithing of the spinal cord was followed by convulsions and twitching of the hind limbs. The Tr. Calotropis, drachm one and alcoholic solution of the juice minims 30 were given to healthy dogs to study their actions.

The symptoms observed on administration are nausea, salivation, vomiting, slowing of the heart and frequent pulse. The sat. sol. of the juice proved very irritant and toxic. It produced an acute gastro-enteritis, restlessness and pain etc., in addition to the symptoms mentioned above and the death occurred about an hour after the administration of the drug.

EXPERIMENTAL INVESTIGATION IN THE ACTION OF THE DRUG.

Externally :—When the juice is applied on the unbroken skin or mucous membrane it acts as a powerful irritant and caustic. Applied to a scarified part or to a cut surface of skin, the juice is a strong irritant and causes a swelling of the surrounding tissues, which is hot and painful.

Internally:—In a dog weighting 14 kgms, under Chloralose anaesthesia, the tracings were recorded with the help of an enterograph. A stomach tube was passed and left in the oesophagus. 30 c. c. of water administered per stomach tube as a control did not produce a marked change. One c. c. of the tincture in 30 c. c. of water given per stomach tube produced a persistent increase in the tone of the stomach. The same dose repeated again gave the similar results. (Plate 1. Fig. a.).

Note the persistent increase in the tone of the stomach in Fig. a at *A* and *B*.

The drug increases the tone of the stomach when given in the form of powder, the Calotropis root bark increases the secretion of the gastric juice by virtue of its being a bitter and thus improves the digestion and increases the appetite. It is therefore a bitter tonic and stomachic. In larger doses it causes nausea and excites the flow of saliva and increases the bronchial secretion. In still larger doses it produces vomiting followed by depression and exhaustion.

Intestines:—In a bitch weighing 11 kgms. the movements of the small intestines were recorded with the help of an enterograph. The

intravenous injection of the tincture in small doses varying from 0·2, to 0·3 c. c. produced an increase in the tone of the intestines and a decrease in the peristalsis. A slightly larger dose 0·4, c. c. of the tincture produced a little relaxation followed by contraction of the intestines. There is a relaxation again followed by contraction. (Plate 1. Fig. b.) A still bigger dose of the tincture 0·75 c. c. injected in the femoral vein produced a violent contraction (Plate 1. Fig. c)

Isolated segment of Intestine:—An isolated segment of duodenum of a rabbit placed in a bath containing 100 c. c. of Tyrods' solution being oxygenated. The temperature was kept uniform at 37° C. throughout the experiment. Tr. Calotropis 0·1 c. c. added to the bath, where the segment of the intestine was held suspended produced a marked increase in tone. (Plate 1. Fig. e.).

The vagal nerve endings of another segment of rabbit's intestine were paralysed in a bath containing 100 c. c. of Tyrods' solution at 37° C. with atropine. The atropine produced the relaxation of the intestinal segment due to vagal paralysis. The atropine solution, was added to the bath again to insure the complete paralysis of the vagal nerve endings. This failed to produce any more relaxation. The bath was washed out and filled again with 100 c. c. of Tyrods' solution at 37° C. 0·1 c. c. of the tincture added to the bath produced an increase in tone. (Plate 1. Fig. f.).

In another experiment a segment of a rabbit's duodenum was kept suspended in a bath containing atropine in Tyrods' solution for 15 minutes to insure complete paralysis of the vagal terminations. The solution was allowed to run and to the bath containing 100 c. c. fresh Tyrod's solution 0·2 c. c. of the tincture was added. This produce a marked increase in tone persisted for about 8 minutes. (Plate 1. Fig. g.).

Another segment of a rabbit's duodenum was held suspended in a bath and the tincture was added when it produced a marked increase in the tone of the intestine. At B and C atropine solution was added which failed to antagonise its action and could not produce the relaxation of the intestine (Plate 1. Fig. h.)

The volume of a loop of an intestine (small) was taken with the help of an oncometer. This remained practically unaffected under the effect of the drug. (Plate 1. Fig. d.)

CONCLUSION.

Tr. Calotropis increases the tone of the intestines both in an isolated segment and when intact. It causes the intestines to contract and decreases peristaltic movements. After paralysing the

vagal nerve endings the tincture still produced an increase in the tone. The tincture produced a marked increase in the tone and action which atropine failed to antagonize. All these show that the increase in tone is not brought about by stimulation of the vagal nerve endings, but most probably by the action of the drug on the musculature of the intestines.

Circulatory Apparatus Blood Pressure:—The blood pressure was recorded in the right carotid artery of a dog weighing 17 kgms. under chloretone anaesthesia.

Injection of Tr, Calotropis 0·25 to 0·4 c. c. in the dog produced a well marked and persistent rise of blood pressure varying from 70 mm. to 140 mm, of mercury. The blood pressure remained high for about 4 to 10 minutes after which it returned to its normal level, but never went down below the normal. In an atropinized dog with both the vagi cut the rise in blood pressure is more marked (Plate II. Fig. i and j.)

Heart:—The action of the drug on the heart was studied in a bitch weighing 11 kgms. under paraldehyde anaesthesia. The tracings of auricle and ventricle were recordcd with the help of a myocardiograph and artificial respiration was continued throughout the experiment. Tr. Calotropis 0.3 c. c. injected into the femoral vein produced a marked and persistent increase in the force of beats, both of auricles and ventricles. The increased ventricular contractions were more marked, (Plate II. Fig. k.)

The volume of the heart in the atropinized dog was recorded with the help of a cardio-meter, Tr. Calotropis injected intravenously showed a marked increase in the volume of the heart (Plate II. Fig. L.)

Frogs' heart. A rana frog was taken, pithed and perfused the heart intact, through the inferior vena cava with Ringer's solution. The tracing of the ventricles were recorded with a heart lever.

During systole the lever makes an upstroke and a downstroke during diastole.

A. Normal tracings of the frog's heart with Ringer's solution.

B. The frog's heart was perfused with 0.25% solution of Tr. Calotropis in Ringer's solution. This produced a slowing of the rhythm and an increase in the amplitude.

C. The rhythm was slower still and amplitude increased towards systole. The systolic contraction was increased and the dilatation during diastole was greater.

D. The rhythm had become very slow and the diastole was much prolonged. The toxic action of the drug had set in.

E. The toxic action was more pronounced. The action of the heart was very slow and irregular and intermittent heart block was present and ultimately the heart stopped in systole. (Plate II. Fig. m).

CONCLUSION.

The action of Calotropis on the mammalian heart is to increase the force of the systolic contractions and to cause a persistent increase in the amplitude of contraction and relaxation of auricles and systolic contraction of ventricles. Thus it increases the output of the blood and raises the blood pressure.

In the forg's heart it produces an increase in the force of beats and marked slowing of the rhythm. In toxic doses the heart becomes infrequent, irregular and intermittent. The bronchioles were constricted and there was a marked fall in the blood pressure under the effect of arecoline. Tr. Calotropis 0.4 c. c. injected intravenously produced an increase in the intrathoracic pressure with a rise of blood pressure. This was due to the dilatation of the already constricted bronchioles (under the effect of arecoline) and consequent increase of the volume of the lungs. (Plate 1. Fig. n)

Uterus:-An isolated strip of rabbit's uterus was suspended in a bath containing 100 c. c. of Tyrod's solution at 37° C. Tr. Calotropis 1. c. c. was added into the bath at the arrow mark (Plate 1. Fig. 0.) and it produced a strong contraction of the uterine strip with incomplete relaxation following, The stimulating action occurs in all animals, whether pregnant or not, and the action is attributed to direct effect upon musculature.

TOXICOLOGY

The milky juice of the plant is very acrid and is used for criminal purposes as an abortifacient and as an infanticide in human beings. When applied on the raw surface or over a freshly cut skin, it is absorbed and produces an acute inflammatory swelling of the surrounding tissues and may produce general poisoning. The milky juice is some time used in mallacious poisoning of cattle.

The following experiments were undertaken to study the toxic action of the drug.

1.Subject. A healthy dog weighing 8 Kgms.

2-30 P.M. Pulse 92 per minute.

2-35 P.M. The following was given by stomach tube :—

Alcoholic Sat. sol. of Calotropis juice 40 m.
Aqua.....2 oz.

2-40 P.M. The dog walks about, cries and is restless, pulse 105 per minute.

2-50 P.M. Nausea, attempts at emesis and vomited twice, pulse 105 per minute.

3 P.M. Vomiting continued. The animal arches the neck, lowers the head and makes several attempts at emesis but only vomits a white foamy liquid. Pulse 90 per minute.

3-5 P.M. Passed semiliquid faeces. Pulse 83 per min.

3-15 P.M. The animal looks depressed. Dribbling of saliva from the mouth. Occasional attempts to vomit. Pulse 75 per min.

3-25 P.M. The animal prefers to lie down and shows a great desire for water, which however is quickly rejected on drinking. Pulse 68 per minute.

3-35 P.M. Dribbling of saliva continued and the animal remained lying for most of the time. Pulse 65 per min. The animal looks very much exhausted.

3-45 P.M. The dog keeps lying down and pulse 90 per minute.

4-15 P.M. The dog lost the control over the hind limbs.

Pulse very much accelerated, weak and almost imperceptible. The animal died after a few convulsive movements at 4-18 P.M.

P. M. report :—

Acute gastro-enteritis with excoriations of the mucous membranes.

Congestion and fatty degeneration of the liver.

2. To another dog weighing 8 kgms, Alcoholic Calotropis solution of the juice 15 m. in 4 dr. of distilled water was injected subcutaneously. The animal showed the following symptoms:—After half an hour's time the dog became restless, jumped and cried. Respirations accelreted and laboured and profuse salivation from the mouth. Pulse infrequent later irregular and intermittent. The animal died an hour and three minutes after the injection.

Post mortem examination revealed an enteritis of the small intestines, fatty degeneration of the liver and endo-carditis close to the apex in the left ventricle.

3. The third dog weighing 9 kgms was injected with 15 min. of Alcoholic sat. solution of the juice in 4 dr. of sterilized distilled water intraperitonealy. The animal uttered a few cries, walked

round, dribbling of saliva from the mouth and fell down. The pulse was weak and imperceptible and soon the heart stopped beating, the animal took a few gasps and died 7 minutes after the injection.

4. Donkey male 10 years.

The alcoholic sat. sol. of the juice 1 dr. injected subcutaneously. The animal showed the following symptoms:—After 15 minutes there was perspiration all over the body particularly over the scrotum, neck and ears. Respiration accelerated. Later the animal became restless, bathed in perspiration, lost the control over the hind limbs and fell down. The animal tried to get up but could not do so and struck his head against the ground. Respiration infrequent, pulse weak and frequent, neighing frequently. The animal kept lying down respiration deep and occasional, pulse very weak and almost imperceptible. The donkey died an hour and eight minutes after the injection.

P. M. Liver highly congested, small intestines inflamed and kidneys congested.

A dun horse 7 years old was admitted as an inpatient on the 4th June 1931. The animal had a contusion of the off shoulder. The owner treated him by applying Calotropis juice over the shoulder after scarification which produced symptoms of poisoning. There developed a huge painful swelling on the shoulder, breast, fore-arm, neck and extending upto the head. The animal was restless and could not bear weight on the off fore leg. The swollen parts pitted on pressure and the prescapular lymph gland was enlarged and swollen. Respiration and pulse accelerated. Temperature ranged between 102° and 103·4°F.

The restlessness increased and the nervous symptoms developed, the animal striking its head against the ground and remained lying most of the time. There was trembling of the muscles and the animal was in a great distress. It died 4 days after.

To study the toxic action of the drug further the respiration and blood pressure were recorded in a dog. The Alcoholic Sat. Sol. of the juice 0.5 c.c. injected into the femoral vein, first raised the blood pressure and then brought it down to zero. The heart stopped beating and the respirations became irregular and intermittent but they continued even after the heart stopped (Graph 1, Fig. P.) The juice is very irritant and corrosive poison. It produces an acute gastro-enteritis when given per mouth. When applied on a scarified skin over a large area or over a raw surface, it produces an extensive painful swelling. It may get absorbed and produce symptoms of poisoning. It acts particularly on the small intestines, liver and heart after absorption. There is very little danger of its poison-

ing when applied on indolent ulcer or over chronic yoke and saddle galls. This is due to the fact that in indolent and longstanding ulcers a lot of fibrous tissue is formed, which checks its absorption and thus the action remains localised to the part where it is applied.

ANTIDOTES.

In cases of poisoning by calotropis give plenty of demulcent and mucilaginous drinks such as milk, rice gruel etc. Administer morphine and atropine to allay the pain. If the poisoning is due to absorption from the skin the local treatment consists in applying cold water to the swollen part, followed by Glycerine Belladonna or some such soothing preparations. If the juice is sticking to the part it must be well washed to remove the juice completely before applying anything over the affected place. When there is a danger of heart failure diffusible stimulant and heart tonics such as ether or camphor are indicated.

DISCUSSION.

Tinctures of the drug were prepared by processes of percolation and maceration according to the directions given in the British Pharmacopœa for preparing such things. Out of these one prepared by the process of maceration was found more active pharmacologically. This tincture was used throughout the experiments to maintain uniformity.

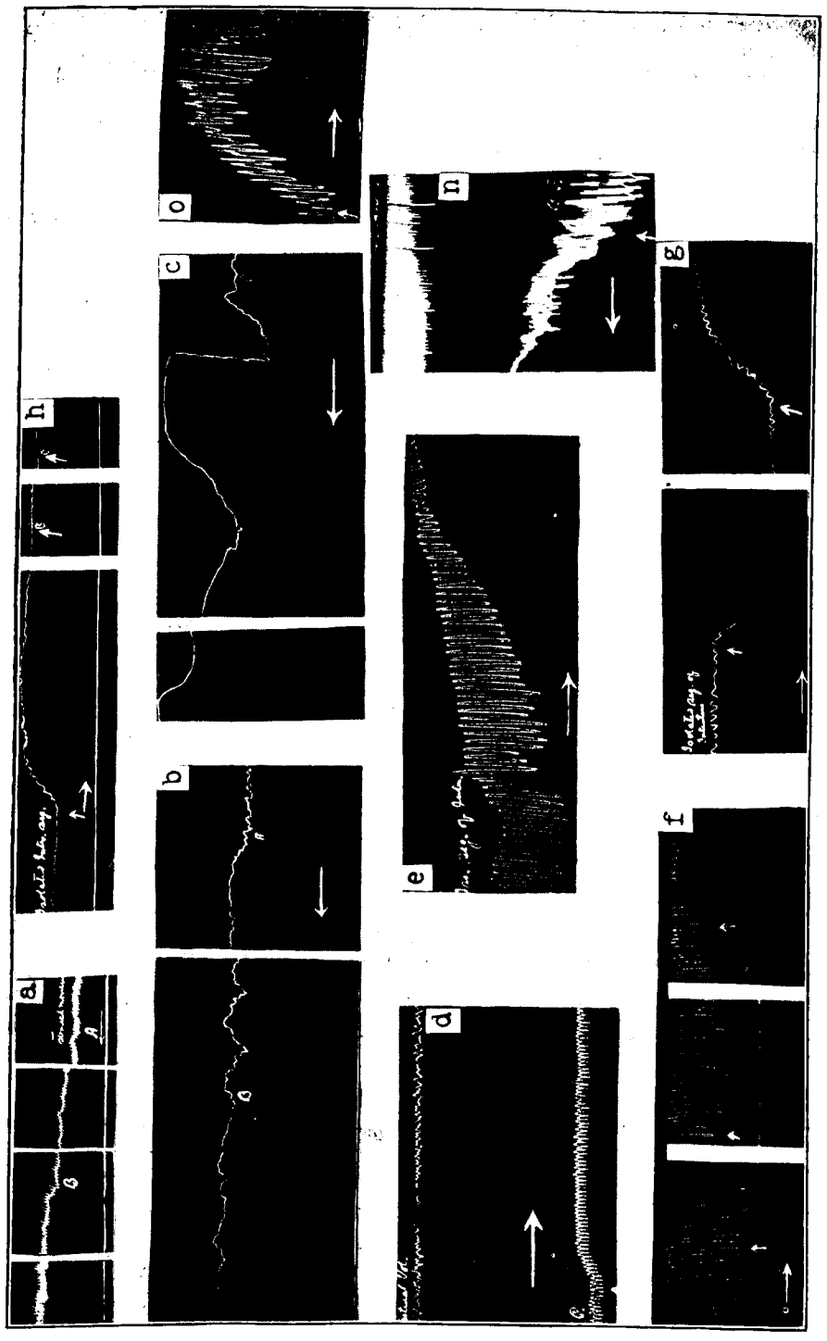
The alcoholic sat. sol. of the juice being highly poisonous is never used in the ordinary experiments. This is used when the toxic action of the drug was studied as the juice is the common source of poisoning. The decoction was found less active pharmacologically.

The tincture calotropis increases the tone of the stomach and intestines. Both pharmacological and toxic doses of the drug appear to have selective action on the small intestines and liver, whichever channel of administration is used. The action on the intestines is not through the vagal nerve, as it persists even after the paralysis of the vagal nerve endings with atropine and the contraction produced by Tr. Calotropis cannot be antogonized by atropine. The drug acts most probably on the musculature of the intestines.

The drug causes a slowing in the rate of the heart and it also increases the force of the heart and raises the blood pressure.

In brief the summary of its action in medicinal doses is that it is a sialagogue, stomachic, bitter tonic, emetic (in bigger does), expectorant, intestinal tonic, ecbolic, dilates the contracted bronchi, heart tonic and alterative.

PLATE I



To illustrate the actions of Calotropis Procera and Calotropis Gigantea on the various organs of the dog, frog and rabbit.
For explanation see pages 120 & 121.

Dose :—Root bark powder, Dog.....2 to 8 grains.
Horse and cattle..1 to 3 dr.
Tincture of Calotropis. Dog.....5 to 15 m.
Horse and Cattle..2 to 3 dr.

THERAPEUTIC USES.

Charaka recommends its root bark in piles. Leaves to cover the boils.

Shushruta mentions its use in ear-ache, asthma and dog bite. Bhaghbhatta used it in tooth-ache.

Chakradatta used it in elephantiasis, hydrocele and scorpion bite.

In the 5th chapter of an old Sanskrit book named Bhavprakash it is recommended for mange, leprosy, ulcers, enlargement of the spleen, piles, intestinal parasites, cough and asthma etc.

USES IN THE VETERINARY PRACTICE.

Externally:—The fresh milky juice is a useful blistering agent but it should not be applied over the raw surface or freshly cut skin or over a large area, as there is a danger of its absorption and poisoning.

1. When applied on indolent ulcers, chronic yoke and saddle galls, it increases the vascularity and hastens the healing. The application is best made in a small quantity every fourth or fifth day; once the ulcer is healthy, or alternatively, if from irritation a big swelling has developed around, its use should be discontinued.

2. The oily preparation made by boiling together sesame oil 8 parts, Calotropis juice 16 parts and turmeric one part is said to be very useful in eczema, mange, and other skin diseases.

3. A powder of the leaves is dusted on the ulcers to destroy excessive granulations.

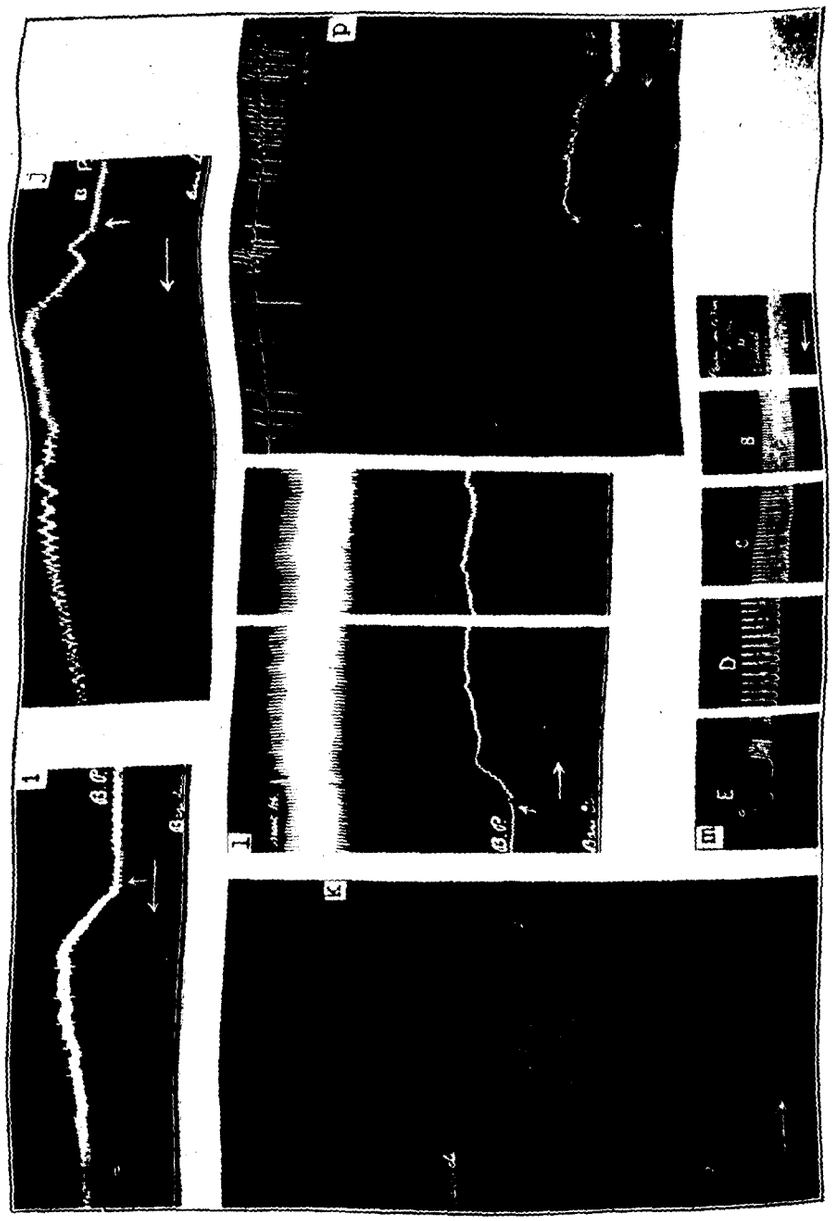
4. The juice when applied over a developing abscess acts as a blister and helps it to come to a head early.

5. *Internally*:—It is a useful drug in chronic tympanitis (due to atonic condition of the rumen) to give tone to the rumen. For this purpose the powder can be prescribed with nuxvomica.

6. In chronic dyspepsia and dilatation of the stomach small doses give tone to the stomach, increases the flow of the gastric juice improves the digestion and increases the appetite.

7. In can be given with advantage in atonic condition of the intestines. It is a useful remedy to tone up the intestines after an acute attack of enteritis or Rinderpest. The powder can preferably be given in rice gruel.

PLATE II



To illustrate the actions of Calotropis Procera and Calotropis Gigantea on the various organs of the dog, frog and rabbit.
For explanation see pages 120 & 121.

8. It is also indicated in chronic dysentery and in skin diseases.

9. The tincture or the powder may be given in chronic bronchitis and bronchial asthma in combination with other antispasmodic and expectorant drugs.

10. It forms a very good cough and expectorant electuary as follows :—

For a horse.

℞

Calotropis root bark (mudar ki jar ki chal)	...	1 dr,
Long pepper powder (pipal or maghan)	...	½ dr.
Camphor (mushik kafur)	...	½ dr.
Liquorice root powder (mulathi)	...	2 dr.
Linseed meal and treacle	...	Q. S.

M. ft. Electuary.

Sig. To be given twice a day.

The electuary is very useful in sore throat, bronchitis, pneumonia, and heart diseases like pericarditis etc. to give tone to the heart.

The drug is still being tried in various diseases and should definite results emerge from further investigation they will be communicated in due course.

I express my profound thanks to W. Taylor Esq., M. R. C. V. S., D. V. H., I. V. S., Principal, Punjab Veterinary College, Lahore for his kind guidance and advice in my work.

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EXPLANATION OF THE PLATES.

GRAPH No. 1.

(*a*) Tracing showing the movements of the stomach of a dog weighing 14 kgms. under chloralose anaesthesia. Note the persistent increase in the tone of the stomach.

(*b*) Tracing showing movements of the intestines of a bitch weighing 11 kgms. under chloralose anaesthesia.

(*c*) Tracing showing the effect of a bigger dose (0·75 c.c.) of Tr. Cal. on the intestines. Note the violent contraction produced under the effect of the drug.

(*d*) Tracing showing the action of Tr. Cal. on the intestinal volume.

(*e*) Tracing showing the action of Tr. Cal. on an isolated segment of rabbit's intestine. Note the marked contraction of the intestinal segment.

(*f*) Tracing showing the action of the drug on an isolated segment of intestine after paralysing the vagal nerve endings with atropine.

(*g*) Tracing showing the action, of the drug on an isolated segment of rabbits' intestine suspended in Tyrod's Sol. containing atropine, for 15 minutes to insure the complete paralysis of vagal endings. Note the increase in tone on addition of Tr. Cal. after vagal paralysis.

(*h*) Tracing showing the action of the drug on the isolated segment of rabbit's intestine. Note the contraction of the intestine produced by Tr. Cal. and atropine added into the bath at B and C failed to antagonize its action.

(*i*) Tracing showing the action of the drug on blood pressure in a dog weighing 17 kgms. under chloretone anaesthesia.

(*j*) Tracing showing the action of the drug on blood pressure of a dog weighing 12 kgms. under chloretone anaesthesia with vagi cut.

(*k*) Tracing showing the action of the drug on auricle and ventricle of a bitch weighing 11 kgms. under paraldehyde anaesthesia.

The levers move upward during systole, and during diastole downward.

(*l*) Tracing of heart volume in an atropinized dog weighing 8 kgms. under paraldehyde anaesthesia.

(*m*) Tracing of a frog's heart intact perfused with 0·25% solution of Tr. Calo. in Ringer's tropis solution.

During systole the lever makes an upstroke and downstroke during diastole.

(*n*) Tracing showing the action of Tr. Cal. on the intrathoracic pressure of a dog weighing 11 kgms. under chloretone anaesthesia. The bronchiols are already constricted under the effect of arecoline.

(*o*) Tracing showing the action of the drug on an isolated strip of a rabbit's uterus. Note the marked contraction under the effect of the drug.

(*p*) Tracing showing the toxic action of the drug on a dog weighing 12 kgms under chloretone anaesthesia. Note the sudden fall in the blood pressure due to stoppage of the heart under the toxic effect of the drug.

A RAPID METHOD OF EVAGINATING THE SCOLICES IN PARASITIC CYSTS.*

BY

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During the course of post-mortem examinations many parasitic cysts are met with and difficulty is usually experienced in evaginating their scolices for the purpose of studying their suckers and hooks. The following experiments were therefore carried out with a view to find out a rapid laboratory method for evagination. The cysts used in these experiments were cysticercus tenuicollis from goats and cysticercus bovis from cattle.

PRESSURE METHOD.

This method has been recommended in many text books. It was therefore the first to be tried. Cysticercus tenuicollis was the cyst selected. By means of gentle kneading movements applied to the caudal end of the vesicle, attempts were made to press out the invaginated scolex. The result of several such attempts was that the cysts invariably burst and it was not possible to evaginate the scolex.

SALINE METHOD

In this method the cysts of different sizes were collected from goats and their outer connective tissue capsules were removed, Each cyst was then placed in petri-dish containing normal saline solution ('85 per cent.) Some petri-dishes were placed in the incubator at 37°C temperature, others were kept at room temperature.

No change was seen in cysts kept at room temperature. But the other cysts within an hour of being placed in the incubator began to evince peristaltic movements during which the alternate protrusion and retraction of the extremity bearing the scolex was very striking. These movements continued for a long time but, even after 48 hours, no scolex got evaginated.

DILUTED BILE METHOD.

In this method cysts of various sizes obtained from goats as well as cysticercus bovis from cattle were used. After their outer connective tissue capsules had been removed each cyst was placed in a petri-dish containing bile (obtained from a carcase) diluted with distilled water. Some petri-dishes were kept at room temperature while others were kept at incubator temperature (37° C).

* Presented to the Indian Science Congress, 1933, Patna.

No change was visible in the cysts kept at ordinary room temperature. In the case of those kept at incubator temperature, movements were seen as in the saline method and in addition evagination of the scolex usually occurred within 20 hours.

SODIUM TAUROCHOLATE METHOD.

In this method, both cysticercus tenuicollis and cysticercus bovis were used. After removal of their outer capsules each cyst was placed in a petri-dish containing 1:per cent., aqueous solution of sodium taurocholate. As before some of these dishes were kept at incubator temperature (37°C) and others at room temperature.

In the case of the cysts kept at room temperature no change occurred. In the case of those kept at incubator temperature movements were observed as in the saline method but they were rather sluggish. In all cases evagination occurred within 18 hours.

In another experiment the cysts were placed in 5 per cent. solution of sodium taurocholate instead of one per cent. Within a short time of being placed in the incubator the cysts showed active movements like those seen in the saline method. Evagination occurred in 20 minutes to 2 hours.

SODIUM GLYCOCHOLATE METHOD.

In this method both one per cent. and 5 per cent. aqueous solutions of sodium glycocholate were tried. It was noticed that when the cysts were placed in these solutions they contracted somewhat and assumed a globular appearance. The cysts did not show any movement and by the time evagination had occurred, (usually more than 20 hours) the caudal vesicle was always found to have disintegrated.

RINGERLOCKE SOLUTION.

In this experiment cysticerous tenuicollis cysts were placed in Ringerlocke solution '024 grams. Some of the cysts were placed at room temperature.

In the cysts kept at room temperature no change was observed. In those kept at the incubator temperature however rapid movements were visible within a short time (1 hour) but evagination did not occur until after 30 to 48 hours. During all this time the cysts were viable and disintegration of the cysts did not occur until long after evagination.

DISCUSSION.

The certainty with which evagination occurs when one uses bile or sodium taurocholate is very noteworthy. The effect of bile and its salts on surface tension is well-known and t has been shown

by many workers that such varied phenomena as amoeboid movements, contraction of muscle and biliary movements, can be satisfactorily explained by assuming alterations in surface tension. The results of these experiments would also appear to suggest that some similar alterations in surface tension are responsible for the process of evagination under natural conditions.

Conclusion.

(1) Of all the methods tried for evaginating the scolices of the parasitic cysts, the one with 5 per cent. sodium taurocholate kept at 37°C is the most rapid.

(2) The time taken in evagination appears to vary with the concentration of sodium taurocholate.

(3) These findings suggest that surface tension plays some part in the process of evagination under natural condition.

Clinical Articles.

VENTRAL HERNIA IN A HEIFER.

BY

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Subject :—A heifer, Sind local cross, aged one year, in good condition.

Date of admission :—29th June 1932.

History of the case:—Milch cattle are cared for in this district only during the period of lactation. Afterwards they are let loose to pick up what they could from the adjoining hills and dales, and housed only during night time. In this case, one morning the owner found the patient with the right abdomen, well distended and pendulous, as if there was a big sized football under the skin. As it had an unsightly look and as the amimal showed discomfort, he brought it to the institution either to be cured or to be destroyed.

Symptoms :—There was inability to move freely and uneasiness caused by this distension. On examination it was found that the swelling was due to the herniated bowels. Owing to the extensive swelling the extent of the rupture of the abdominal wall could not be definitely gauged.

Treatment :—The animal was prepared for an operation, and operated on the next morning.

The operation :—The part was shaved, washed with soap and water and then with rectified spirit. The animal was anasthetised. The body was covered with two sterilised towels exposing only the seat of operation.

An incision about 9" long was made from the middle of the flank directing downwards and forwards. Soon after the skin was incised, a large portion of the intestines came out through the opening. The rupture was found originating from the posterior end of the flank running downwards and forwards along the border of the distal extremities of the ribs and extending to the posterior border of the sternum. The ruptured muscles were found congested.

The difficulty of pushing the bowels in, and suturing the severed muscles now arose. The skin could not be opened to the full extent of the internal rupture for obvious reasons. The muscles were very tense and the task of bringing these edges together for suturing was great. With some difficulty the severed edges were brought in apposition by interrupted sutures using silk for the same, the peritoneum being included in the above suture. The internal walls of the thick skin were sutured together to give support to the interrupted sutures undernath. The edges of the skin were afterwards sutured as usual. Finally the seat was dressed with Collodium andBoric Acid and a strong broad bandage was applied over the part. After half an hour the animal got up and walked. It was housed immediately and was practically starved that day. For the next four days the diet consisted of only gruel. The sutured edges were coated daily with Collodium mixed with Boric Acid to form a paste and thus preventing entrance of infection from without. There was slight swelling over the part for three or four days but it disappeared after hot fomentation twice a day.

Special features :—There was no rise in temperature. The animal began to ruminate on the third day. There was no trouble with the wound, and the sutures were removed on the seventh day and the patient discharged cured in fourteen days time.

We are thankful to Mr. K. S. Natesa Ayyar, the District Veterinary Officer, Calicut, for the personal supervision during the operation reported above.

A SUCCESSFUL CAESARIAN SECTION IN A CAT WITH RUPTURE OF THE UTERUS.

BY

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Veterinary Assistant Surgeon, Ootacamund.

The subject of this case was the same cat on which a Caesarian Section was successfully performed on 18th July 1930, and which was recorded in the pages of the Indian Veterinary Journal, Vol. VII, No. 3.

The cat had become pregnant after the above operation and was brought to the hospital on 24-2-31, suffering from Dystokia, due to Tail presentation. On examination, the kitten was found dead inside and caesarian section was immediately decided upon.

Under chloroform anaesthesia, an incision was made midway between the last rib and point of the hip. On opening the abdomen, it was found to contain fluid, which, on scrutiny, was found to come out of a ruptured uterus. However, the uterus was brought out, enveloped in a warm towel and opened. One live kitten, with its attached placenta, was removed intact. The other kitten was dead and was difficult to dislodge. The cause for this was found in a tear of the uterus, about 1 inch long, just near the os, wherein a leg of the kitten had become impressed. With slight manipulation, this was removed, and, with it, the attached placenta. The tear in the uterus, as well as the incision, were sutured with catgut. The abdominal cavity was mopped out with sterile gauze, 3 c.c. of sterile camphorated oil poured into it, and the abdominal incision closed with separate sutures for muscles and skin. The cat recovered from the anaesthetic without much trouble.

The next day, the temperature was 104·5° F, and a dose of Mixed Infection Phylacogen (P. D. & Co.) was given subcutaneously. The temperature remained high till the 5th day, and the cat refused all food, although it looked bright and nursed its kitten very well. The restraint in the cage was thought to be the cause of this, and, therefore, the cat was sent home with the kitten on the 5th day. Thereafter, the recovery was rapid and quite uneventful.

A typical illustration of the proverbial cat with nine lives!

Discussion :—The object of putting in the Camphor Oil was to minimise the extension of the infection by the stimulation of the lymphatics and, the result of the case, had amply justified the procedure.

A CASE OF SUPPRESSION OF URINE IN A BUFFALO.

BY

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History of the case :—The case was an eight year old cart buffalo of Salur, bound for Jeypore, which according to the owner had suffered from foot and mouth disease the previous month when it was working in the plains. Due to that attack the buffalo was much debilitated and as the cart-man entirely depended upon the cart hire, he could not afford to give the animal sufficient rest to recoup its health. He began to work it soon after its recovery.

On the advice of other cart-men he began feeding the buffalo with black variety of Kulti half a seer a day from 2-4-33, because of a belief in the plains that this black variety of Kulti acts as an antirheumatic tonic and stimulant. He noticed that it had suppression of urine from the afternoon of 5-4-33. In this condition the animal was brought for treatment on 7-4-33.

Symptoms :—The temperature, pulse and respirations were found to be normal. The buffalo was feeding well and passing normal amount of dung and drank its usual quantity of water.

The animal was given a subcutaneous injection of Dieuretin 30 grains in Aqua Distiliata 30 c.c. The injection was given on 7-4-33 at 7 p.m., and at 7-45 p.m., the animal passed about 1½ gallons of deep straw coloured urine. During the later part of the night there was scanty urination, hence the injection was repeated at 1 a.m., and within half an hour after injection the buffalo passed another gallon of urine. During the early hours of the day it passed a moderate amount of urine. The peculiarity of the case was (1) the absence of any discomfort due to suppression of urine for two days, (2) the prompt action of Dieuretin in that case.

ASCITES IN DOGS.

BY

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A pariya dog was brought for treatment with ascites. It was decided to try treatment with Novasurol. Accordingly the animal was subjected to a subcutaneous injection of 1 c. c. of Novasurol on the first day, and Ammonium Chloride was given orally thrice daily in 5 grain doses after tapping and removing nearly half the quantity of the ascitic fluid.

The injection was repeated at the intervals of three days with daily oral administration of Ammonium Chloride. Four injections were given in all. The food during the course of treatment was restricted to raw meat and dry bread with very little water to drink. The dog was active throughout.

The animal was observed for about one and a half months after the treatment and it was found that after this treatment there was a complete recovery.

TRYPAFLAVIN IN A CASE OF BABESIA BIGEMINUM IN A BULLOCK.

BY

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AND
P. M. THILLANAYAGAM, G.M.V.C.,
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Subject:—A country bred white bullock, aged 5 years, was admitted as an in-patient No. 1408 on the morning of 20-10-32 at the Veterinary Hospital, Cocanada.

History:—The only complaint presented by the owner was that the bullock was not feeding for the last 3 days and was passing red coloured urine.

Symptoms:—The animal was dull, depressed, did not eat, drink or ruminate, its neck was held extended, it had lachrymation from eyes, drooping ears, hard breathing, constipation and a temperature 106·4°F. The blood smears examined under microscope revealed numerous *Babesia bigeminum* present in the red blood corpuscles. Almost every red blood corpuscle was found to be infected. The organism occurred from one to two pairs within the red blood corpuscles and by their presence in large numbers it was considered that the infection was very severe. On the same day at 9 a.m. the animal received 20 c.c. of 2% solution of Trypaflavin (Bayer's preparation) intravenously. In the afternoon at 3 p.m. the temperature was 106.6°F., and the condition of the animal remained unchanged. At that time 15 c.c. of Trypaflavin of 2% solution was again injected intravenously.

On 21-10-32, the morning temperature was 101°F. The bullock appeared to be better and ruminating. The third dose 15 c.c. of 2% solution of Trypaflavin was injected intravenously.

On 22-10-32, the temperature was 101·2°F. The blood smears were examined under microscope and found to be free from *Babesia bigeminum*. As the colour of the urine and general condition was found to be normal. the animal was discharged from the hospital on 22-10-32. The dosage of Trypaflavin was regulated according to the instructions contained in the circular of the Bayer's Firm.

RETENTION OF DEAD FOETUS IN A SHE-BUFFALO.

BY

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Subject:—A she-buffolo, country bred, primipara, aged four years, admitted on 6-1-1932.

History:—The animal was brought from Anaparti-savaram village, 20 miles off. The owner said that she aborted three months ago, and he thought that the foetus was dropped in the field. She commenced lactation after the incident but soon went dry.

Symptoms:—General condition was poor, could not lie on her side, but lay crouched on the sternum drawing all legs under the abdomen. Temperature 100°F. Ruminating and eating well. The animal showed some difficulty in the act of micturition and the urine had a bad odour.

Diagnosis:—The owner pressed me to examine her "inside" because the village quack had told him that she had bones inside her belly. Only to please him the animal was cast for examination. When she was thrown down she passed a stinking, sero-sanguineous putrid discharge from the vagina. The animal was douched with Potassium Permanganate lotion, and the examination revealed a partly *mummified* foetus.

Treatment:—The os was dilated and the skull of the retained foetus had to be broken and the foetus was removed in pieces. The douche was again repeated and a dose of Magnesium Sulphate, liquid extract of Ergot and palmyra jaggery was given. Next day, *i.e.*, on 7-1-1932, the animal was able to lie down normally and no on the sternum and urine was passed normally.

The animal was discharged quite well after a few days.

TRANSMISSION OF BLACK QUARTER IN NATURE.

BY

R. K. RAM,

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Black Quarter in cattle appears to be more common than is generally believed, but its natural mode of infection has not been discovered yet. The predominating opinion is that the infection takes place through abrasions or wounds on the legs or feet or mouth. Some years ago some discussion on the mode of infection appeared in the American Journals. Some observers were of opinion that the bacilli were carried by the intestinal worms and the infection was through the damaged mucous membrane of the intestines or through the punctures by the larvae of trematodes etc., on their passage to or through the liver. This theory was based on the assumption that these observers, after most careful examinations, failed to detect any lesions or punctures on the feet or mouth in positive Black Quarter cases. The author considers that the theory of infection through the abrasions of the feet or the mouth is nearer the truth and he bases this opinion on his experience gained during his attendance of outbreaks of Balck quarter in young cattle,

In 1928, while at the Government Cattle Farm at Patna, he examined typical cases of Black Quarter from beginning to the end and conducted post-mortem examinations of the dead. All were young calves and heifers below 2 years of age. A few of the cases are summarised below :—

1. A male calf ten months old showed swelling and intense pain on the right fetlock on 27-8-28 which was treated symptomatically with lead lotion bandage. The pain and swelling appeared to subside, but on the 28th the swelling went up above the knee to the forearm and the shoulder with crepetation, with fever, etc., usually found in Balck Quarter. The animal died on the 28th night and the post-mortem revealed all signs of Balck quarter. The diagnosis was confirmed microscopically. In this case the lesions showed that the inflammation had proceeded from the foot to the shoulder and the chest. Infection had evidently entered through the foot though no marks of any injury or wound were present.

2 and 3 :—Two calves died, one on the 23rd and another on the 28th August 1928, and both had typical symptoms of Black Quarter. The diagnosis was confirmed microscopically. In these cases, the illness commenced with submaxillary swelling which gradually extended to the dewlap, neck and shoulder. It was evident that the infection was first in the oral cavity and then it extended to the other parts.

4. A heifer one year old showed febrile symptoms on 4-10-1928 in the evening. She did not show any lameness or any local lesions though the temperature was 104° F. Late in the night she died. Microscopical examination both before and after death was negative for Anthrax. A careful examination after death revealed no marks of violence on any part of the body externally or in the muscles. The post-mortem examination revealed the following changes :—

(i) A portion of peritoneum 6″ × 5″ near the liver and a part of ileum about a foot was highly inflammed and hæmorrhagic. In one place there was a dark clot of blood 3″ long and 1″ in diameter.

(ii) Liver was very much congested and in parts degenerated, and in places almost pulpy.

(iii) Both kidneys were inflammed with hæmorrhagic spots all over. It was significant that the lesions were confined to organs that were close to each other. It was unfortunate that portions of the affected part of the intestine etc., were not examined microscopically, but it was thought that when so many deaths:had occurred with Black Quarter in the locality, this animal also had died of that disease. It is likely that in this case the infection was through the mucous membrane of the ileum as suggested by the American observers.

5. Another calf was ill on the 26th and died on the 27th August 1928 with clinical symptoms of Black Quarter and was subsequently confirmed microscopically. In this calf the right hind quarter was affected and the lesions first started about the hock gradually involving the muscles of the thigh, loins and the back. It was very likely that the infection was through the right foot though no lesion could be detected.

6 and 7. Two calves, died in July 1928 showing clinical symptoms of Black Quarter, and subsequently confirmed microscopically. The swelling in these calves commenced at the sternal region and extended to the shoulder and chest. The infection perhaps entered the region of the sternum while the animals were lying down though no signs of external injury could be seen.

I have ventured to place the above observations on record to say that even though visible injuries were absent yet they may be so small as to give enough room for the infection to enter.

A CASE OF SURRA IN A DOG

BY

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P. M. THILLANAYAGAM AND K. TIRUVENGADASWAMI PILLAI,
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Subject :—A cross-bred terrier dog, 2 years old, belonging to Mr. J. A. Selly, Samalkot (10 miles from Cocanada) was brought to the Veterinary Hospital, Cocanada, on 8-6-32 with the complaint that it was not feeding well.

Symptoms and treatment :—Temperature 104°F., discharge from the eyes, cough, constipation and pustules under the abdomen. The disease was suspected to be distemper and sulpharsenol 12 centigrammes (dissolved in 2 c.c. distilled water) was injected intramuscularly in the thigh. A dose of Quinine Sulphate 5 grs. dissolved in diluted sulphuric acid in 1 ounce of water and salol 5 grs. in powder was supplied to the owner for the next two days. The dog was brought to the hospital on 11-6-32 and was reported to be feeding well. The temperature was 102·4°F. A second injection of sulpharsenol 18 centigrammes (in 3 c.c. distilled water) was given intramuscularly in the thigh on the same day.

On 23-6-32, the dog was brought again with the history that he was not feeding well. The temperature was 104°F. The blood smears examined microscopically revealed trypanosomes indistinguishable from *Trypanosoma Evansi* and the disease was put down as surra. Quinine Sulphate and salol were given internally as before.

On 28-6-32, the condition of the animal was rather bad, temperature 104·4°F., very weak and a swelling appeared on the face above the nostrils. The animal was admitted as an inpatent in the Veterinary Hospital, Cocanada. As sulpharsenol was found to be inefficacious for trypanosomes, sulphostab 0·45 grm. (in 5 c.c. distilled water) was injected intramuscularly in the thigh. In the evening temperature rose to 105·4°F.

On 29-6 32, the temperature was 102·8°F, in the morning and 102·4°F., in the evening and repeated Quinine Sulphate and salol internally.

On 30-6-32, the temperature was 102·4°F., in the morning and 102°F., in the evening. Quinine Sulphate and salol were continued.

On 1-7-32, the temperature was 102°F., in the morning and 101°F., in the evening. Gave *Easton's Syrup*.

On 2-7-32, the temperature was 101·4°F., in the morning and 101°F., in the evening. Repeated *Easton's Syrup*. The swelling disappeared and the animal looked lively and was feeding well.

On 3-7-32, the temperature was 101·4°F., in the morning and 103·2°F., in the evening. The animal was feeding well. Mucus was noticed in the fæces. Bismuth Subnitras and salol were given 5 grs. each in powder by the mouth.

On 4-7-32, the temperature was 100·8°F., in the morning and 101·4°F., in the evening. Bismuth and salol were repeated.

On 5-7-32, the temperature was 101°F., in the morning and 100·6°F., in the evening. Bismuth and Salol were continued. As there was no improvement in the condition of the animal, "Bayer 205" (Naganol) was ordered from Havero Trading Co., Ltd., Calcutta.

On 6-7-32, the temperature was 102·2°F., in the morning and 101·8°F., in the evening. Quinine sulphate and salol were given by the mouth. Sulphostab 0·25 grm. (in 5 c. c. distilled water) was injected a second time intramuscularly in the thigh. The blood smears examined were found to be negative for trypanosomes.

On 7-7-32, the temperature was 102·6°F., in the morning and 101.2°F., in the evening. Quinine sulphate and salol were given internally.

On 8-7-32, the temperature was 102·2°F., in the morning and 101·4°F., in the evening. The blood smears revealed trypanosomes. Quinine sulphate and salol were given internally.

On 9-7-32, the temperature was 103°F., in the morning and 103·4°F., in the evening. The dog went off its feed. Quinine sulphate and salol were given internally.

On 10-7-32, the temperature was 105·6°F., in the morning and 104·6°F., in the evening. The animal was off-feed and the blood smears revealed trypanosomes. Quinine sulphate and salol were given internally.

On 11-7-32, the temperature was 105·6°F., in the morning and 104·6°F., in the evening. Injected 2 grs. of soamin (in 5 c.c. distilled water) in the morning intramuscularly in the thigh. Subsequently "Bayer 205" was received. Injected 5 c.c. of 10% solution of "Bayer 205" (8 grs. in 5 c.c. of distilled water) intravenously in the evening.

On 12-7-32, the temperature was 103°F., in the morning and 101.4°F., in the evening. The blood smears examined were found to be negative for trypanosomes.

From 13-7-32 to 17-7-32, the temperature was normal ranging from 100.4°F., to 101°F., both morning and evening. The blood smears of 14-7-32 and 16-7-32 were found to be negative for trypanosomes on microscopical examination and the animal was discharged

cured on the evening of 17-7-32. Again "Bayer 205" was injected on 9-8-32 as a preventive for trypanosomes. The blood smears examined subsequently on 1-8-32 and 19-8-32, were also found to be negative for trypanosomes.

Source of infection :—Neither biting flies nor ticks were noticed on the body of the dog and the source of the infection cannot be defenitely stated. It is possible that the infection might have been obtained by ingestion of blood or meat from jackals affected with surra. The dog is reported to have been in the habit of fighting with jackals in the vicinity.

Conclusion :—It would appear that a single intravenous injection of "Bayer 205" constitutes a very useful form of treatment in surra of the dog due to *Trypanosoma Evansi* and renders the blood completely sterile and free from trypanosomes. A second injection of the same was subsequently given as a preventive. Sulpharsenol and sulphostab were found to have no effect on trypanosomes even though two injections of each were given. Soamin, though used on this case, is known to have no effect on *Trypanosoma Evansi*. Quinine sulphate, Salol, *Easton's Syrup* and Bismuth Subnitras administered by mouth had no action on trypanosomes. The dog has been reported to be well so far. But he will be kept under observation and should any relapse occur, a further note will be published.

CHIRATTA IN PIROPLASMOSIS OF CATTLE CAUSED BY BABESIA BIGEMINUM.

BY

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During the past 12 months, a number of cases of *Babesia begeminum* in cattle have been brought for treatment to the Veterinary Dispensary, Peddapuram and they have been successfully treated with the following :—

℞

Pulvis chiratta.	ʒi
Sodii bicarbonas.	ʒss.
Treacle.	q. s.

M. Ft. Elec : Sig twice a day. Repeat for two or three days.

The above doses are for adult cattle and may be altered according to the size of the animal.

It is seen that the temperature comes down to normal on the 2nd or 3rd day, the urine gradually changes in colour to normal and the animal is discharged cured on the 3rd or the 4th day.

Altogether 16 cases were treated during the period and the history of 9 of them in which microscopical confirmation was obtained is detailed below.

1. *Bullock*, No. 1310.—Aged, admitted on 4-2-32. Temperature 106.2°F., condition good, not feeding well. Blood smears were positive for *Babesia bigeminum*. An electuary of pulvis chiretta 1 oz., and bicarbonate of soda ½ oz., was given in treacle for 3 days. The temperature dropped to 103°F., by the next morning and to 101°F., by the following day. The urine became normal. The bullock recovered completely and was discharged cured on 7-2-32.

2. *Cow*, No. 1504.—Aged, admitted on 14-3-32. Temperature 104°F., haematuria from 3 days, not feeding well. The bowels were slightly loose. The blood smears were positive for *Babesia bigeminum*. An electuary of pulvis chiretta 1 oz., and sodii bicarb ½ oz., was given in treacle twice a day. On 15-3-32, the temperature was reduced to 102°F., and on 16-3-32 it was 101°F. The urine was quite normal on 16-3-32 and the animal was discharged cured on the same day.

3. *Bullock*, No. 1540.—Aged, admitted on 21-3-32. Temperature 105°F., haematuria present, condition fair, not feeding well. Blood smears were positive for *Babesia bigeminum*. Treatment was the same as for the above cases for 3 days. On 22-3-32, temperatue was 102°F., and the urine was almost normal. On 23-3-32, temperature and urine were normal. The same treatment was continued. The animal was discharged cured on 24-3-32.

4. *Heifer*, No. 1584.—Aged 1 year, admitted on 31-3-32. Temperature 104·4°F., haematuria from 2 days, not feeding well, condition poor. Blood smears revealed *Babesia bigeminum*. An electuary consisting of pulvis chiretta ½ oz., and bicarbonate of soda 2 drms., in treacle was given. On the following day, the temperature came down to 103°F., and the urine was almost normal. On 2-4-32, temperature was 101°F., the urine was normal, the blood smears did not reveal the organisms and the animal was discharged cured.

5. *Bullock*, No. 56.—Aged, admitted on 11-4-32. Temperature 104·2°F., haematuria from 4 days, not feeding, not ruminating and much reduced in condition. Blood smears were reported to be positive for *Babesia bigeminum*. On 11-4-32, an electuary of pulvis chiretta 1 oz., and sodii bicarbonate ½ oz., was given in

jaggery. The dose was repeated in the evening also. On 12-4-32 and 13-4-32, temperature was 101°F., the urine was light in colour and the animal was taking a little grass. The treatment was continued. On 14-4-32, temperature was 101°F., urine was normal and the animal was feeding well and ruminating. The treatment was continued until 16-4-32 and the animal completely recovered and was discharged cured on 17-4-32.

6. *Bullock*, No. 325.—Aged, admitted on 10-6-32. Temperature 106°F., haematuria from a day, condition fair, and slight diarrhoea. Blood smears revealed *Babesia bigeminum*. An electuary consisting of pulvis chiretta 1 oz., and bicarbonate of soda ½ oz., in jaggery was given in the morning and evening. On 11-6-32, temperature was 103°F., and the urine was light in colour; repeated the same electuary. On 12-6-32, temperature was 101.4°F., and the urine was normal. The electuary was continued. The animal recovered completely and was discharged cured on 13-6-32.

7. *Bullock*, No. 811.—Aged, admitted on 1-10-32. Temperature 106·2°F., anorexia, dull and depressed, haematuria from 3 days and hurried respiratious. Blood smears were reported to reveal both *Babesia bigeminum* and *Theileria mutans*. On 1-10-32, pulvis chiretta 1 oz., and bicarbonate of soda ½ oz., was given as an electuary in jaggery both morning and evening. On 2-10-32, temperature was 105°F., the animal was in extreme unsteady gait and there was oedema of the bowel and dewlap and legs. The treatment was repeated. The animal died during the night of 2-10-32.

8. *Bullock*, No. 932.—Aged, admitted on 24-10-32. Temperature 105°F., haematuria from 3 days, complete anorexia, watering from the eyes, condition good and dung soft. Blood smears revealed numerous *Theileria mutans* and a few *Babesia bigeminum*. An electuary consisting of pulvis chiretta 1 oz. and bicarbonate of soda ½ oz., was given in jaggery. The dose was repeated in the evening also. On 25-10-32, temperature was 103·4°F., in the morning and 102·8°F., in the evening. The animal was dull and listless. Completely refused food and water. The colour of the urine was red. The electuary was continued both morning and evening. The animal died on the night of 25-10-32 at about 8 p.m.

9. *Heifer*, No. 1191.—Aged 2 years, admitted on 7-12-32. Temperature 104·2°F., haematuria from a day, watering from the eyes, dung slightly loose, the mucous membranes were slightly pale. Blood smears revealed numerous *Babesia bigeminum*. An electuary consisting of pulvis chiretta ½ oz. and bicarbonate of soda 2 drms. was given in jaggery. On 8-12-32, the temperature was 103°F., and the urine was almost normal. The treatment was repeated. On 9-12-32, the temperature was 101°F., the urine was normal, the treatment was continued and the animal was discharged cured.

In conclusion, it would appear that pulvis chiretta in combination with bicarbonate of soda constitutes a very easy and effective form of treatment in Piroplasmosis of cattle due to *Babesia bigeminum*. It does not seem to be of any use in cases affected with *Theileria mutans*, as two cases treated (Nos. 7 and 8) resulted in the death of the animals. As both the drugs are cheap and easily procurable, it would be of much use in the villages where cases of haematuria in cattle due to the presence of *Babesia bigeminum* are quite common

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A CASE OF UNUSUAL SEAT OF BLACK QUARTER LESION IN A BULL CALF. *

BY

K. J. SUBRAMANIYAM G.M.V.C.,

Veterinary Inspeetor, Tumkur, Mysore State.

It gives me great pleasure to place before the meeting the following case of Black Quarter that came under my notice during May 1933. In the course of attendance to a Black Quarter report, the village, Jodi-Vanadanhalli, of Tumkur Taluq, was visited on 16-5-33. Soon after my arrival at the village, a grey bull calf aged about 10 months, belonging to the Jodidar of the village, was brought to me with the history that it returned home with an inflamed eye and the cause of it was not known.

On examination it was found that the right eye was inflamed considerably and the eyelids were closed. There was lachrymation and when the cornea was examined it was found to be opaque. The whole eye ball looked large and prominent. There was no sign of any external injury. The eye was irrigated with boric lotion and fomentation was advised. About half an hour after this the animal showed rigors, was dull and had no tendency to suck the cow. The calf showed a temperature of 105·6°F. Since the village had reported an outbreak of Balck Quarter, I examined carefully the quarters, back, shoulder and the neck, but could not find any lesions. It was concluded that it may be an atypical case of Black Quarter and treated it with 100 c.c. of Black Quarter serum intravenously and

*Paper read at the Fifth Annual Meeting of the Mysore Veterinary Medical Association, Bangalore, June 1033.

electuary containing Camphor ½ dram and Pulvis Ginger 2 drams with treacle was given,

The case was left on the verandah of the house in which I was camping and was watched frequently. It was observed that the right eye had enlarged itself to the size of a man go. Only a very small region about a square inch near the inner canthus crackled when pressed with the fingers. The rest of the swelling was hard. There was copious discharge of a dark coloured sanguineous fluid of unpleasant smell from the nostrils. The inflammation extended to the face. At about midnight the animal showed restlessness and at about 4 A.M., the breathing became accelerated and difficult, the animal began to groan. The condition of the animal became worse and it died at about 6 A.M., about 12 hours after the visible changes in the right eye.

Post-mortem Examination:—From the nostrils there was sanguineous discharge. The skin near the right eye was dry. The subcutaneous connective tissue was infiltrated with blood. The muscles surrounding the orbit was of a dirty brown colour, and rich in fluid. In the abdominal cavity there was about an ounce of serous fluid. Spleen was normal in size. The mucus membrane of bronchi and nasal passage were congested. A couple of blood smears and a bit of muscle from the lesion near the eye were sent for microscopic examination.

Mr. K. Ranganatha Rao, the Deputy Superintendent, Civil Veterinary Department, who examined the specimen declared that the muscle juice smears contained Black Quarter organisms, and the blood did not contain any organisms.

In this case the probable mode of infection might have been near the conjunctiva, since these young animals have a tendency to charge and rub the head against mounds of wet earth. In this village this was reported to be the third case, which showed similar symptoms. In some parts of Tumkur Taluq such cases seem to have occurred and people there call it as "Pig Disease" or "Handi Roga" because of the inflammation of the face. It is of some interest therefore to note that a Black Quarter lesion may appear on the face.

A FREAK OF NATURE.

BY

R. D. SINGH.

Veterinary Assistant Surgeon, Begusarai, B. & O.

A kid was born on 1-10-32 at Pantres in the Begusarai sub-division, District of Monghyr, with six legs, two recta and four testicles, two between each pair of its hind legs.

It sucked milk from its mother for 15 days after its birth and then would not do so, yet it survived for six days more and died on the 21st day after birth.

Both the recta were fully developed and the kid could defaecate through both. Curiously enough, both the recta automatically got closed after a fortnight after birth from which time it stopped feeding and the kid died of tympany apparently.

Celosomian and Monosomian Monstrocity. (See Page Next)

CELOSOMIAN AND MONOSOMIAN MONSTROCITY.

BY

J. C. DAVID, G.M.V.C.,

Veterinary Assistant Surgeon, Tellicherry, Madras.

In Vyallalum, a hamlet of Kallai, one of the nearest villages of Tellichery, I was called on the 5th August 1933 to render assistance to a cow in labour pains. The owner informed me that the cow was in pains from the 3rd August. I found that she was uneasy, frequently changed her position and strained violently. The vulva looked contracted and there was no "show".

Vaginal exploration revealed the presence of a still calf with four limbs behind the cervix and careful examination revealed that there was one body with one big head and two faces. The body looked twisted. The calf was lying on the right-cephalus-illiac position in transverse presentation. (Sterno-abdominal) and the head was deep in the pelvis.

Both the four limbs were corded and drawn out. The hind limhs being intruders were pushed far back into the uterus. The calf rotated to the Dorso-sacral position. One of the faces was turned back towards the body of the calf and the other towards the exit. The inner canthus of the orbit of the left (latteral) eye was hooked and steady traction effected a safe delivery of the monster.

The monstrocity was a full time heifer calf with 6 teats. Two heads and 2 atlases joined into one, but head divided into two towards the lower half thus having 2 faces, 4 eyes (2 central and 2 latteral) ears 2, nostrils 4. Limbs fore and hind 2 each, Tail 1, anus one, external genital one. Liver, spleen, stomach and intestines were not covered by parietes. Back haunched and there were no vertebræ beyond the hump but only the usual muscles were present.

Remarks :—It appears that this monster is a new thing. It is a combination of two monstrosities described in the books.

1. *Celosomian* :—Class 1, order 11, Species C. 2 of Schistocephalus—for the reason that the monstrocity is destitute of abdominal parietes and otherwise deformed in various degrees.

2. *Monosomian* :—Class 11, order 111, Species 1 of Dicephalus—Biatlanticus—on the basis that the monstrocity has one single body —two heads and two atlases united and two divided faces.

The photograph of the calf was taken by me and it is attached herewith.

Hotchpotch for Veterinarians.

Dr. Otto Stader recommends a mixture of

Phenol 1 part
Tinct Iod. 1 part
Glycerine 2 parts

as the best treatment for chronic and sub-acute cervicitis of cows with copious discharge. The mixture is applied by swabbing and usually one application is enough to bring about resolution within a fortnight.

* * *

Mr. W. E. Wilkinson, M.R.C.V.S., writing on the virus-serum method of Distemper immunisation says that the occasional break-down of immunity, due perhaps to the virus getting inactivated by the serum immediately administered, can be prevented by the inoculation of serum ½ to 1 hour after that of virus.

* * *

For Sclerestomes in horses, Professor Marotel after trial of 6 different agents concludes that the two following are the best vermifuges against strogyles :—

1. Carbon Tetrachloride ("Didakol") in an average dose of 50 c.c. with Castor oil and medicinal paraffin 100 c.c. each and

2. "Vermifuges Lagaillarde" consisting of

Turpentine	100
Chloroform	20
and Castor oil	300

followed immediately by hypodermic injection of arecolin. As an alternative to the mixture No. 2, an electuary consisting of Essence of Turpentine 100, Chloroform 20, and aloes 20 may be administered.

Dieting for from 24 to 36 hours before and for 6 hours after treatment is necessary.

* * *

Mr. L. M. Alcorn considers anaplasmosis of cattle a comparatively new disease which should interest every Veterinarian. He finds Sodium Cacodylate very effective when administered intravenously in a 12½% solution with a dosage of 90 to 180 grs.

Clande Hudson reports 3 cases of snake bite in dogs. 2 dogs bitten by copper-head snake (Agkistrodon Mokason) and 1 by huge

timber rattle-snake (crotalus horridus) treated successfully with mulford's polyvalent snake antivenin (15 c.c. doses intravenously). The report concludes with the following 3 don'ts :—

Don't run or exercise the animals.

Don't give alcoholic stimulants which only help to distribute the poison quickly.

Don't injure tissues by injecting Pot. Permanganate as it is of no value as antidote.

* * *

Dr. Bower recommends Potassium dichromate and iron chloride in drinking water as effective in treatment of coccidiosis in rabbits.

* * *

J. McGunn Professor, R.V.C., London, recommends carbon dioxide and boric solution as an effective dressing in poll evil, fistulous withers, quittor, deep-seated sinus cases and septic wounds &c. Also as a mouth wash he finds it excellent. An apparatus modelled on the soda syphon is employed for the purpose. Solution of borax is put into the bottle and Co_2 is released into the lotion by the usual sparklet.

* * *

Very good results in cases of grass tetany and milk fever are recorded by Mr. H. A. Pulles by the intravenous injection of

Calcium chloride	27 grms.
Magnesium chloride	8 ,,
Water	250 ,,

The injections must be done slowly and carefully but discontinued if heart beats become irregular.—*S. D. A.*

* * *

Colds in dogs:—Colds are still a matter of mystery to the medical profession. Their exact cause and cure are unknown although colds now rank as the one disease which does most damage.

In dogs it is difficult to treat a cold. The inhalation of vapors such as camphor gives temporary relief to the nasal and throat passages. A slight laxative at the beginning of the siege is desirable.

Also an Aspirin tablet, the usual 5 grain size, given three times a day for one or two days will help considerably. On the second day a dose of milk of magnesia should be given.—*Dog World.*

* * *

Skin treatment :—There is no quick cure for skin ailments and as you know in your research, most skin affections still remain a mystery.

Excessive sun will irritate a bad skin condition. Sunning is desirable only for a dog whose skin is entirely healthy. Do not bathe your dog in any way as long as he has a skin ailment. Rubbing olive oil into the skin twice daily with your fingers over a period of 30 days helps to effect a cure. Too many irritating applications only intensify a skin condition.—*D.W.*

* * *

Why should dogs contract Distemper at shows when Veterinarians are provided to examine the dogs which are entered? It is only possible for the Veterinarians to prevent the admission and the benching of sick dogs. This service is usually 100 per cent. efficient, because it is very rare that one brings an actually sick dog to a show. This inspection does not suffice because shipping crates, beddings, utensils, etc., may harbour the infection. Also, it does not prevent the public, some of which may come from infected kennels and petting.

In view of these facts, owners, breeders, and handlers should famialiarise themselves with the knowledge of its methods of spread and its prevention. They should have their various veterinarians administer preventive inoculation to their dogs before coming to the show, and this cannot be depended on to the neglect of hygienic measures. In other words, honest effort and team work by all concerned, to remove the popular ignorance of disease prevention, will be necessary before the prevalence of Distemper can be eliminated in the home, the kennels and the shows.—*D.W.*

* * *

Are eggs good food for dogs, and should they be fed raw or cooked? Egges are excellent for dogs, because egg yolk is not only rich in protein, calcium and iron but also vitamins. The food value and quality of eggs greatly depends upon the care and diet of the chickens which lay them.

The yolks seem to be as easily digested when raw or cooked, but the raw white of egg, unless slightly beaten, is not as easily acted upon by the digestive fluids as when coagulated by cooking.

* * *

Do you recommend the muzzling of dogs to prevent the spread of rabies? No. The homeless strays that spread this disease are never muzzled. I would suggest the vaccination of all dogs not maintained under proper surveilance, and a heavy penalty for dog owners that permit unvaccinated dogs to roam at large and be bitten in fights or painfully injured by autos, etc.—(*D.W.*)

Plant poisons dog:—A litter of nine puppies were turned loose in a small yard, in the corner of which a medium size rhododendrun (allied to laurel) was growing. As the puppies were only permitted to use the yard for a matter of an hour a day, little attention was paid to the possibility of rhododendrun poisoning. However, four of these puppies were observed in the act of chewing up the plant. Little was thought of the matter till the following day when first one and then each of the other three showed distinct diarrhoea which was followed by a partial and transitory paralysis of the legs.

The U. S. Department of Agriculture has studied such poisoning in sheep and cattle, and reports that about two-tenths of one per cent. of the body weight of the animal in rhododendrum or laurel leaves must be ingested before toxic, lethal doses are reached. However, immediate use of plenty of linseed oil internally has proven beneficial for such poisoning.—*D.W.*

Transliteration & Translation.

नाना जातीनामायुः

ನಾನಾ ಜಾತೀನಾಮಾಯುಃ

The Longivity of various animals,

BY

L. V. RISHI, G. B. V. C.,

Veterinary Surgeon, Unjha, Baroda.

उक्तं च जातक पारिजातके नाना जातीनामायुः

ಉಕ್ತಂಚ ಜಾತಕ ಪಾರಿಜಾತಕೇ ನಾನಾ ಜಾತೀನಾಮಾಯುಃ

The Longivity of various animals, as mentioned in the book Jātākapārijatāka.

समाः षष्टि द्विर्म्ना मनुज करिणां पञ्चक निशाः ।

ಸಮಾಃ ಷಷ್ಟಿ ದ್ವಿರ್ಮ್ನಾ ಮನುಜ ಕರಿಣಾಂ ಪಂಚಕ ನಿಶಾಃ ।

हयानां द्वात्रिंशत् खर करभयोः पञ्चक कृतिः ॥

ಹಯಾನಾಂ ದ್ವಾತ್ರಿಂಶತ್ ಖರ ಕರಭಯೋಃ ಪಂಚಕ ಕೃತಿಃ ॥

The longivity of a man and an elephant is one hundred and twenty-five years and five nights, of horses it is thirty-two years, of asses and camels it is twenty-five years.

विरूपा साप्यायुः वृषभ महिषयोः द्वादश शुनाम् ।

ವಿರೂಪಾ ಸಾಪ್ಯಾಯುಃ ವೃಷಭ ಮಹಿಷಯೋಃ ದ್ವಾದಶ ಶುನಾಂ ।

स्मृतं छागादीनां दशक सहिता षट्च परमम् ॥

ಸ್ಮೃತಂ ಛಾಗಾದೀನಾಂ ದಶಕ ಸಹಿತಾ ಷಟ್ಚ ಪರಮಮ್ ॥

Of bullocks and buffaloes it is one less than the above; (*i.e.*, 24 years), of dogs it is twelve years, and goats and other animals of the similar kind, it is sixteen years.

गृध्रोऽल्लूक शुक ध्वांक्ष सर्पाणां च सहस्रकम् ।

ಗೃಧ್ರೋಲೂಕ ಶುಕ ಧ್ವಾಂಕ್ಷ ಸರ್ಪಾಣಾಂ ಚ ಸಹಸ್ರಕಂ ।

श्येन वानर भल्लूक मंडुकानां शतत्रयम् ॥

ಶ್ಯೇನ ವಾನರ ಭಲ್ಲೂಕ ಮಂಡುಕಾನಾಂ ಶತತ್ರಯಂ ॥

The longivity of a vulture, an owl, a parrot, a crow and a serpant is one thousand years, of a hawk, a monkey, a bear and a frog, it is three hundred years.

पञ्चाशदुत्तर शतं राक्षसानां प्रकीर्तितम् ।

ಪಂಚಾಶದುತ್ತರ ಶತಂ ರಾಕ್ಷಸಾನಾಂ ಪ್ರಕೀರ್ತಿತಂ ।

नराणां कुञ्जराणां च विंशोत्तर शतं विदुः ॥

ನರಾಣಾಂ ಕುಂಜರಾಣಾಂಚ ವಿಂಶೋತ್ತರ ಶತಂ ವಿದುಃ ॥

Of a demon it is hundred and fifty years of a man and an elephant, it is one hundred and twenty years.

द्वात्रिंशदायु रश्वानां पञ्चविंशत् खरोऽष्ट्रयोः ।

ದ್ವಾತ್ರಿಂಶದಾಯು ರಶ್ವಾನಾಂ ಪಂಚವಿಂಶತ್ ಖರೋಷ್ಟ್ರಯೋಃ ।

वृषमाहिषयोश्चैव चतुर्विंशति वत्सराः ॥

ವೃಷಮಾಹಿಷಯೋಶ್ಚೈವ ಚತುರ್ವಿಂಶತಿ ವತ್ಸರಾಃ ॥

Of horses it is thirty two years, of camels and asses it is twenty-five years, of a bullock and a buffalo, it is twenty four years,

विंशत्यायुः मयूराणां छागादीनां च षोडश ।

ವಿಂಶತ್ಯಾಯುಃ ಮಯೂರಾಣಾಂ ಛಾಗಾದೀನಾಂಚ ಷೋಡಶ ।

हंसस्य पञ्चनवकं द्वादशाब्दाः पिकाः शुनाः ॥

ಹಂಸಸ್ಯ ಪಂಚನವಕಂ ದ್ವಾದಶಾಬ್ದಾಃ ಪಿಕಾಃ ಶುನಾಃ ॥

Of a pea-cock it is twenty-years, of goat and other animals belonging to its species it is sixteen years, of a swan it is fourteen years of cuckoos and dogs it is twelve years.

तद्वत्पारावतानां च कुक्कुटस्याष्टवत्सराः ।

ತದ್ವತ್ಪಾರಾವತಾನಾಂಚ ಕುಕ್ಕುಟಸ್ಯಾಷ್ಟವತ್ಸರಾಃ ।

बुद्बुदाना मंडजानां सप्त संख्या समाः स्मृताः ॥

ಬುದ್ಬುದಾನಾ ಮಂಡಜಾನಾಂ ಸಪ್ತ ಸಂಖ್ಯಾ ಸಮಾಃ ಸ್ಮೃತಾಃ ॥

And the same is said of pigeons, of cocks it is eight years, and of the animals born out of bubbles and eggs, it is seven years.

Notes.

We have much pleasure in commending to our readers the two papers from the pen of Prof. W. L. Williams, Professor Emeritus; Formerly Professor of Obstetrics and Research, Diseases of Breeding Cattle, New York State Veterinary College at Cornell University, Ithaca, published in this issue of our *Journal*. The paper on the "Placentation of Equine Twins" in our opinion, is the first and only attempt of its kind to clearly and fully describe and illustrate such conditions. His attempt to offer a logical explanation for the high mortality and other interesting phenomena associated with it is unique.

* * *

We feel glad to say that we are as much grateful to Dr. Udall, Professor of Veterinary Medicine and Hygiene, New York State Veterinary College at Cornell University, Ithaca, and his associates in his department, as Prof. Williams is to them all, in connection with the paper on the "Bovine Twins and Free-martins", which has been made possible through Dr. Udall's courtesy.

* * *

We are glad beyond measure at the happy news that after all the Royal Veterinary College, London, is to have a permanent abode of its own. The site has been purchased and over £250,000 are to be spent on buildings and equipment of the various departments.

* * *

An institution of world-wide repute, it was labouring all these years under several handicaps, but found satisfaction in the conscientious discharge of its duties. It broke the heart of all of its well-wishers, when the news was broad-casted that it was to be closed for want of funds! All is well that ends well. The Governors of the College deserve the gratitude of the profession in no small measure.

* * *

A recent advertisement for recruitment of 30 Veterinary Assistant Surgeons under the Civil Veterinary Department, Madras, came in for a good deal of criticism in the lay press, due to the fact that all the 30 posts are to go to other classes than Brahmins! We tried to get at the cause of such a glaring piece of injustice. We were told that it was intended to balance an over recruitment of Brahmins on previous occasions.

* * *

It is not our intention to tread on the controversial grounds of communal preference. But it could have been done with the least harm if they had not recruited Brahmin students for the College. Having selected them and given them due training and diploma, the Government are shutting them out from the only venue of eking out their livelihood in a poverty stricken country like India. That does not appear to us to be fair.

* * *

Madras Civil Veterinary Department seems to be full of vacancies just now! Retirements and casualities have been many. But the delay in filling up such vacancies is a mystery of mysteries. There are still men in the old 'list' provided by the Public Services Commission but yet they are not to be recruited! Paucity of men used to be an old and chronic excuse with the Directors of Veterinary Services, but now men there are in plenty but only the Directors do not move in the matter. One can curse only the ill-fate of the profession in Madras.

* * *

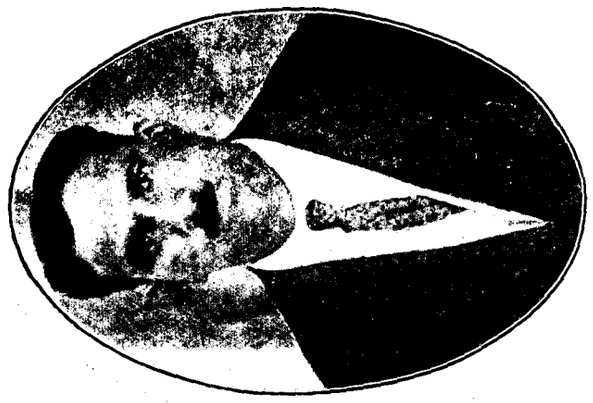
We invite the attention of our readers to an extract from the "Hindu" of Madras (28th August 1933) published elsewhere in this

SARDAR SAHIB SARDAR MUL SINGH,
Professor of Pharmacology and Materia Medica, Punjab Veterinary College,
Recipient of Birthday Honours.

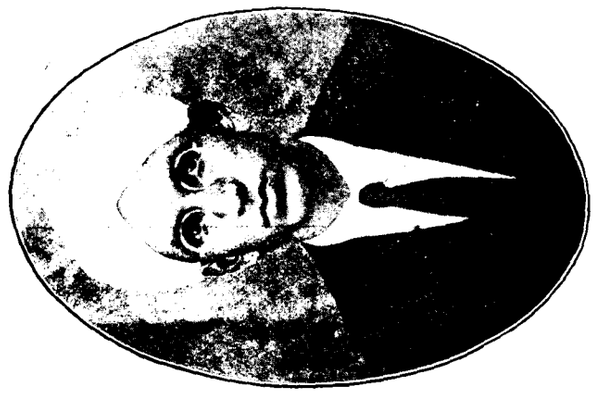
Report published in July Issue of Indian Veterinary Journal.

Rai Sahib BABU SRISH CHANDRA GHOSH,
Veterinary Inspector, Silchar Circle, Assam, Recipient
of Birthday Honours.

Report published in July Issue of Indian Veterinary Journal.



Muhammad RAHIMUDDIN Esq., G.M.V.C.,
Who has proceeded to Edinburgh for
Post Graduate Studies.



P. S. KUPPUSWAMY IYER Esq., G.M.V.C.,
Who has proceeded to Edinburgh for
Post Graduate Studies.

J. D. DAVID Esq., G.M.V.C.,
Who has proceeded to Edinburgh for
Post Graduate Studies.

issue of the *journal* regarding the institution of a Degree in Veterinary Science, in the University of Madras. We have often pleaded for this step in these columns and it is long over due. But we are glad the goal is in sight.

* * *

We are glad to note that three more Veterinarians from the Madras Presidency, Messrs. J. D. David, P. S. Kuppuswamy and Mahamad Rahimuddin have gone abroad for post graduate courses in different branches of Veterinary Science. We wish them all a happy and useful sojourn and safe return.

* * *

Our readers will be glad to know that agreeing with the recommendations of the Director of Agriculture in Mysore the Government of His Highness the Maharajah of Mysore have directed the Serum Institute at Bangalore to be made permanent as its importance and usefulness have been now well-established. The Institute has been shifted to its new and permanent buildings adjoining the Agricultural School and Farm at Hebbal, Bangalore.

* * * *

Mr. S. D. Achar, G.B.V.C., who was working as Assistant Superintendent in the Serum Institute in its earlier stages is now the officer in charge of the Institute. We are sure under Mr. Achar the Institute will continue to maintain its high reputation and make itself increasingly useful to the profession and the State.

* * * *

We invite the attention of our readers to an extract published elsewhere in this issue from our local contemporary the "New Times" on 'Cattle Diseases Bill' to be introduced in the Legislative Council of the Central Provinces. It is said that the object of the bill is to make compulsory the vaccination against Rinderpest of all imported cattle at stated quarantine posts and to take power to prohibit or disperse a fair or market in order to prevent the outbreak or spread of any infectious cattle disease. In the absence of details we refrain from commenting on this measure ; but, we have no hesitation in saying that a measure of this kind is long overdue in all the Provinces. We hope the authorities and Legislators in C.P., will realise the importance of this measure and soon pass it into an act, and thus set an example for other Provinces to follow,

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We invite the attention of our readers and the authorities in Madras to an article extracted elsewhere in this *Journal* on "Agriculture and Cattle" by Rao Bahadur C. S. Subramaniam, B.A., B.L., ex-M.L.C., Advocate, and Land-holder, Mayavaram in the "Hindu" (Madras) of 7th June 1933. Mr. Subramaniam is a public worker of long-standing and great eminence and as such his remarks on the subject are of great value.

* * * *

A valuable comminication on the "Control of Stray dogs", from Mr. M. V. Pillai, G.B.V.C., of Penang, is published in this issue. It is well worth perusal. Such measures are long overdue in India and it is for our Legislators to move the Government in the matter. 'Service men' have an axe to grind in the eyes of the Government if such problems are raised by them. Let us hope the vital nature of the problem will be realised by all concerned.

* * *

We extract in this issue an article from the lay press on the use of Goat Virus in the field against Rinderpest, in that enlightened State of Mysore. It is another feather in the cap of Mysore. Where others are still groping in the dark, Mysore makes a bold bid with its lighted torch and asks others to follow! All Honour to Mysore.

* * * * * *

Major R. F. Stirling in Central Provinces has done equally convincing work on the use of Goat Virus as a possible method of protection for general adoption against Rinderpest in the field, thus minimising the cost of production to a great degree and simplifying the technique very much. Over 7400 cattle have been protected in this way in Central Provinces.

* * * * * *

It must also be said to the credit of Madras that she has been trying to explore the possibilities of this new method in her field conditions. A senior District Veterinary Officer Mr. R. Narasinga Rao has been entrusted with this work and he has so far done this on nearly 200 head of cattle with very encouraging results. Some of these protected cattle were later tested by him with Bull Virus and the immunity set up was found to be satisfactory. Further work is still proceeding.

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The day may not be far off when this new method will be generally adopted as it will prove a great relief to the depleted finance of the several presidencies and provinces.

Association News.

THE MYSORE VETERINARY MEDICAL ASSOCIATION, BANGALORE.

Fifth Annual Meeting Saturday, June 17th, 1933, 7-30 a.m.

Before the meeting commenced, a group photo was taken.

President :—Dr. Leslie C. Coleman, M.A., Ph.D., C.I.E., Director of Agriculture in Mysore.

Invocation over, the President of the Association (Mr. K, Krishna Iyengar, G.B.V.C.,) delivered his *Welcome Address* as follows :—

Mr. Chairman and Gentlemen,

On behalf of the Managing Committee of the Mysose Veterinary Medical Association, I have great pleasure to welcome you all and thank you for your attendance and hearty co-operation towards the success of this meeting.

At the outset let me thank you, Sir, on behalf of all present for your so kindly and readily assenting to preside to-day, in the midst of your multifarious engagements.

You will presently hear the Secretary's report on the working of the Association for the year, but I crave your indulgence to refer to one or two important features of the year's work. It is gratifying to note that of the three resolutions passed by the General Body at their last meeting and recommended by the Director of Agriculture, Government are pleased to accept two of them, namely the question of private practice and extension of Veterinary aid to rural areas, the other of grant of subvention being unfortunately turned down on account of financial stringency. The resolution regarding private practice sanctioned by Government is an important one and affects every one of us individually. Government in their order have been very cautious and while accepting the recommendation of the Director have sanctioned the rules framed tentatively for one year. Gentlemen, it is therefore necessary that the concession granted should be very carefully worked and any gross abuse of the privileges granted either by harassing owners of animals or by refusing veterinary aid owing to the poverty or unwillingness of the owners will lead to disastrous results and will bring the profession and the service into disrepute. I shall therefore sound a note of caution even at the commencement, in order that we may deserve the patronage now extended. To my mind it appears that

Government by their approval have merely accorded their recognition of the useful service rendered by the veterinarian to live-stock owners.

In this connection, I would like to suggest that the members of the Association should strive to enrol as many stock-owners and private practitioners as members of the Association, in order that the rules now sanctioned for private practice may have a wider application, for I believe that many of the agriculturists and stock-owners by becoming members, will be able to appraise correctly the true value of the services rendered and will be educated to call only the qualified men for attendance in preference to quacks and gollas,

With regard to your third resolution about extension of veterinary aid to rural parts under village panchayat, I am gald to say that Government have accepted the principle and have sanctioned Castration Demonstrator's class for the training of men for this work so that improvement of cattle may be greatly speeded up. Regular classes for the first batch of men have already commenced from 10th April 1933.

Gentlemen, our Association has been very fortunate and can congratulate itself on the achievements to its credit. This would not have been possible were it not for our benign Government and a sympathetic Director of Agriculture, who appreciates our work and sympathises in our difficulties. Although we have been able to control the ravages caused by contagious diseases among cattle, and have reduced the mortality under rinderpest almost to a negligible proportion, and may also take credit as the first among the Civil Veterinary Departments in India to adopt boldly, on an extensive scale, the S. S. method of inoculation against rinderpest, we cannot afford to rest there and congratulate ourselves of our past glory. All these have abundantly demonstrated our capacity for service to the State. Still we have hardly touched the fringe of our usefulness to the State and to the live-stock industry.

There are many more important problems awaiting solution at the hands of our profession. During my visit to Delhi to attend the Animal Husbandry Wing Meeting during February last, I was struck with the large number of problems awaiting solution all over India, in common with Mysore. I may at once say, we in our enthusiasm to control rinderpest and other epizootics, have in Mysore a large number of other diseases which are of even greater economic importance such as parasitic infestation, protozoon diseases of various kinds and diseases caused directly or indirectly by mineral and other deficiencies which have not received a fuller attention. Now that we have a well equipped Serum Institute, where research facilities are provided, there is ample scope for intensive research

being conducted on many of our local problems. We should be very grateful to Dr. Coleman, thanks to whose initiative and persistant endeavours, the institute has now become a permanent and valuable addition to the Department. I want to impress upon you all, that great deal of valuable information can be obtained in the field for investigation and I dare say one and all of you have the opportunity to do a large amount of work. In this connection, I am reminded of the words of our Dewan Sahib, who while opening the Seventh All-India Veterinary Conference, said that a general atmosphere of research work should be created and that the energies of a large number of people for conducting studies in observation and collection of data for scientific research should be harnessed. These are wise words, and I would appeal to one and all of you for closer co-operation with the research workers and assist them in field experiments, detailed post-mortem examinations and collection of materials for further investigation etc.

Another direction in which the profession can make itself useful is public health work—I mean the meat and milk inspection in the large cities and towns. Our milk supply to the towns has been uncertain and unhygienic. Even the premier cities of Mysore and Bangalore have no municipal regulation for the production and sale of clean milk. If one looks at the annual recurring infant mortality in our cities and the number of deficiency diseases among both sexes and the mortality under tuberculosis, it is no wonder that with such unsatisfactory and uncontrolled milk supply a large percentage of our people are degenerating and have developed all sorts of deficiency diseases. Milk is the vital food of both the young and adult and if it is not properly guarded for its purity under Municipal Regulation and expert technical supervision, our Municipal Corporations will be overlooking one of their most important duties to their tax payers. This is another field of usefulness to many of our members. You may have to educate the Municipalities and Local Bodies and suggest regulation for a better milk supply. As a preliminary I would suggest that the Municipal Bodies should be requested to build model sheds and milk centres and compel the local gowlies to sell milk under a regulation.

This subject was, I remember, brought up for discussion at the second annual meeting of this Association where it was lost on account of its being a non-profitable industry, dairying not having been a paying concern in Mysore so far.

We can all realise that in these days of financial stringency it may not be possible for the Municipalities to incur any large expenditure, but a beginning could be made in providing model milking

sheds and periodical testing of milk herds under an effective supervision by Medical Officers of Health and Veterinarians. So also in the matter of inspection of animals for meat and supervision of slaughter and examination of meat for human consumption. I may tell you that in a few small Municipalities a beginning has been made and Veterinarians have been appointed on small honorarium. But the premier Municipalities of Mysore and Bangalore far from setting an example to the smaller Municipalities in the State, I am sorry to say, not fallen into line and copied the commendable example of the Municipalities referred to.

Another aspect of our work in the cities and towns which I would like to draw your attention to, is the prevention of cruelty to animals. Every day we are meeting with old, decrepit, and injured animals being worked in carts and ploughs, with very little mercy. Gentlemen, our Government have recognised this and we have rules passed for the purpose, but no endeavour has been made to enforce the rules and bring the offenders to book. Our Municipalities have done nothing nor do the police co-operate with us. The large employment of motor vehicles have no doubt, displaced animal labour, but I can assure you, in our country the horse and bullock cannot be replaced for a long time to come. In this the veterinarian is required to take the initiative and educate the local bodies.

And now let me refer to a few matters purely of service character, I may apologize if my remarks may not be quite palatable but my excuse is, their importance warrants such remarks firstly, by the fact that many of the members are in arrears of their subscription inspite of reminders and appeals. This does not augur well. I need not tell you how important finances are in the well-being of an Association. Your Committee are most anxious to increase the scope of their work but this cannot be done unless our membership is large, and those of you who appreciate the value of supporting your Association, which represents your interests, can certainly help us by enrolling more members. Secondly. I may here refer to the endeavours of the Committee in the matter of the Veterinary Mutual Fund. The General Body resolved that a Mysore Veterinary Mutual Fund should be started for the benefit of the members, accordingly you elected a sub-committee to go into the subject and when the bye-laws were passed last year by the General Body almost unanimously and the Secretary sent round the application forms, hardly 25% of the members have signified their willingness to become subscribers. This apathy is inexcusable and I would strongly urge the need for greater interest and cooperation.

In concluding, I shall be failing in my duty if I do not acknowledge with profound gratefulness the valuable services rendered by

Major Simpson, to the veterinary profession and services to the State. To his vision and enthusiasm is largely due the establishment of the Serum Institute in Mysore, and I can assure you Gentlemen, he will be very happy to learn that it has since been placed on a permanent basis. He was the first President of this Association and evinced the greatest solicitude for the welfare of the profession.

I welcome you Gentlemen once again, and thank you, Sir, for having so kindly consented to preside on this occasion.

The Secretary of the Association (Mr. S. D. Achar, G. B. V. C.) read his report on the working of the Association.

Mr. K. Srikantiah congratulated the Secretary on keeping the expenditure well within the Association's income for the year.

Mr. K. Srikantiah moved the adoption of the Report and after being duly seconded, the motion was put to vote and unanimously carried.

Mr. M. S. Sastry spoke as follows :—

Mr. Chairman and Friends,

I thank you very much for the kind invitation you have extended to me as the representative of the All-India Veterinary Association. I am glad to be able to be present here on behalf of that Association which represents all the British Provinces as well as the Indian States in this country. From the report that was read out by the Secretary and from the welcome speech of the President of the Association, I see your Association has been working very vigorously and it has been fortunate to have the continued patronage of Dr. Coleman, under whose sympathetic guidance you have been able to secure a great deal of success. Two-thirds of the resolutions passed here last year, have met with success at the hands of the Government through the kind help of your patron. I wish all the other Provinces in India could have had similar success and patronage through people like Dr. Coleman. Mysore has been fortunate in having such Directors as are able to guide you and to extend to you the help you need. Your province has been able to lead other provinces in India in departmental and professional matters as well as in the matter of Association. Yours has been the first province that has started the Serum Institute and has put it on a permanent basis. In all the other places where new Institutes have been started, generally it has been the practice to get trained people from outside but you have the local people trained for this purpose. There are several other things for which you can claim credit. It is a pity no other Indian State and Province should have come forward to invite the All-India Association to meet under their auspices. You have

been from year to year successfully holding the Annual Meetings and thrashing out useful and important subjects. Whenever I go here, I see the Officers of the Department from the highest to the lowest assembled together. Every one of you has been putting his shoulders in thrashing subjects of great importance and in bringing about a good many useful resolutions. Once more, I wish to express my grateful thanks to you for the kind invitation you have extended to me on behalf of the All-India Association.

Mr. P. Srinivasa Rao, Editor, *The Indian Veterinary Journal*, spoke as follows :—

Mr. President and Gentlemen,

I shall not be guilty of any breach of convention by starting to speak on any other subject, before I tender my sincerest thanks for your repeated invitation year after year, to a humble individual like myself ploughing a lonely furrow in Madras, without the glamour of any official position about me. I should have thought, that you were tired of inviting me and more tired of listening to my speech. But your invitation again this year took me by surprise and having tasted your hospitality in the previous years, like a true Brahmin, I am back again. Fun apart, Gentlemen, I am deeply grateful to you for your kind invitation.

I fear I will be carrying coal to Newcastle if I begin to talk of the greatness of Mysore to an assembly of Mysoreans. I am sure such repeated encomiums would only make you a spoilt child. But, Gentlemen, you should remember, that the proceedings of your meeting reach far beyond the four walls of this building. So, if we visitors say anything in praise of Mysore, we say all that not in way of pleasant platitudes to beguile the time and please your ears but more with the intention of pointing a moral to our other professional brothers in the rest of India, and Mysore is no more a child to be spoilt but a robust adult who knows what she is about.

Gentlemen, I have had the pleasure of going through your last administration report recently. Every sentence in it made me feel proud of you. The Government itself magnanimously admits that in spite of reduced travelling allowance, the rank and file of the profession did their duty loyally and well. The progress you are making is unparalleled in India. It looks as if you are not going to allow anyone else to beat your record. God bless you in your attempt. I am sure the rest of India will not look upon you with that green-eyed-monster—jealously, but with love, affection and pride. You have made us to look up to you for guidance and help. I pray to God that He may enable you to lead us on from success to success.

Gentlemen, this very gathering held annually without a break, is in itself an eloquent testimony of your team-work, of your love for your profession and of your sense of duty, duty to your province, to your profession and to yourself.

Gentlemen, I shall be failing in my duty if I do not take this opportunity of thanking you all for your kind help to the "*Indian Veterinary Journal*" and I eagerly look forward to your continued help and guidance.

RESOLUTIONS.

1. *That this Association resolves that the Director of Agriculture be requested to depute six Veterinary Inspectors to undergo Post-Graduate course annually in any one of the Indian Veterinary Colleges.*

Mr. K. R. Ramachandra Rao in moving the resolution spoke as follows :—

Mr. President and Gentlemen,

I beg to place before this house the following : This department was amalgamated several years ago. Since then, the idea of the department has been to remove stagnation. There are places like Hebbal, Military Kunigal Stud Farm and the Serum Institute where men are required for special work. I see for the last so many years, people have been working in the same place even though amalgamation has occurred, and when asked why it was so, we had a reply from the Serum Institute that the people working there are specially trained. That means that people working in the department are not able to take up that work. If a man working in the Forest Department takes leave and if any of the Civil Veterinary Department people is put there, the Department then should not say that he cannot cope with the work. If the Department requires him to manage the work of the man on leave efficiently, the departmental man must be trained to be all round. So you will agree with me, and our worthy President will also help us in getting the required help from Government, to send some people from the Department to Cantonment Dairy Farm, one man to Burma or Ceylon for the training of elephants and one or two people for Refresher course in Muktesar or Lahore, so that our people may be able to take up any work anywhere, within the Department.

Mr. T. Krishna Rao :—It must be in rotation.

President :—You ought to widen your resolution, Mr. Ramachandra Rao. It should be somewhat as follows :—

"*That this Association resolves that the Direcror of Agriculture be requested to depute six Veterinary Inspectors*

to such of the Veterinary Colleges in India where Post-Graduate course can be had and to Veterinary Research Institutes".

The mover accepted the modified resolution.

Mr. K. Srikantiah in seconding the resolution spoke as follows: Gentlemen,

I beg to put one more point before the House. The idea of sending departmental people for special branches of study in India is just to make them all-rounders. It has been the present idea of some of the departmental people that a man working in a section of the department should stay there until another man gets trained. Suppose one has to be on leave. What happens? Then somebody should fill up the place. How can the man acting during leave of the permanent man, do the latter's work efficiently, if he be untrained ? So there must be a trained man ready for emergencies. With these words I second the resolution.

Mr. T. Krishna Rao:—In fixing upon people for special training, a point like seniority should be taken into consideration. By sending a man to Burma, he will be fitted to take up work in the Forest Department. Others will not have the chance at all. Therefore it must be restricted only to study in Colleges with post-graduate course.

President:—Do you then object to the phrase "Veterinary Research Institutes"? Do you wish to move an amendment ?

Mr. T. Krishna Rao:—The people selected should have worked both in the Veterinary colleges with post-graduate course and in the Research Institutes.

President:—The object of the resolution is, I suppose, to get better training and not to get better jobs.

Mr. T. Krishna Rao:—He must be in a position to do an all-round work in the department,

President:—You mean he must become an all-round specialist in the course of a year ? I would ask the speaker how it is possible to get training in all the sections of the department in that short course. Personally I think it is impossible.

Mr. Krishnamurthy from Dodballapur:—In selecting candidates for special training, each man must be given a choice according to special aptitude of the individual. Suppose one is good at treating elephants in the Forest Department, he may be given special training in that line. Another man is good at Bacteriology, he may be sent to still further develop his knowledge along that line; yet another in cattle breeding. Thus half a dozen people may be sent to different

Colleges in India annually. With these words I support the resolution.

Mr. M. S. Sastry:—I understand the principle underlying this resolution is that as the veterinary science has been making rapid strides every day, those of us long in service, should brush up our knowledge and should also keep abreast of the times by going to the Research Institutes and Laboratories, so that we may return to our duties with the added knowledge. This principle has been recognised in all the British provinces. I do not think it is very difficult for Dr. Coleman to accept this resolution and to help you in the matter. According to seniority, people in the Madras presidency were being deputed to post-graduate course. But, for the last two years it has been stopped owing to financial stringency. But this year Madras has again taken it up. With regard to the selection of people, I think it must be left to the head of the Department to see to the individual's aptitude etc., and to send him to a suitable place.

Mr. Manickaraj:—Age also must be taken into account.

Mr. Sastri:—I request that Dr. Coleman will kindly recommend this proposition to Government.

President:—Mr. Ramachandra Rao, would you like to say any thing more on your resolution ?

Mr. Ramachandra Rao:—It is not my intention that every one in the department must be all-round. That is not possible. In the Medical Department there are eye experts and ear experts. So also in the Veterinary Department as there is amalgamation, there must be people ready to take up work in Military, Hebbal and Kunigal. Special training in the treatment of horses, in Seriology, in Dairy Farming, and in Live-stock work is necessary.

President:—Before putting this resolution to vote, I wish to say a word or two. In the first place, I note that you have left out of account one institution which is closest to you. I am referring to our own Serum Institute. We have there a most excellent laboratory. We have got men now who are admittedly the equal of a good many of the men in British institutions. Therefore, the first thing you have to do is to develop this institute. This is the Research Institute for men in this department. It has been the policy of the Agricultural Department, your sister department, to take young men into the laborataries for post graduate training, We do not give any degrees, we do not give even a certificate or a diploma at the end of the period of post-graduate training. But if a young man wishes to go for special training, we provide him with the laboratory facilities, we give him the guidance, and we mark out the problems for him. I

wish to remind you that the only way to get real research training is to take up some definite problems. If you want to become a research expert, you have got to do research. I want to point out to you that it will be easier and more right for you to utilise this institution at hand than it would be for providing money for research scholars to go outside. Another point. I cannot depute people. The only body that can depute any of the officers in this department for training outside the State is Government itself. But I understand what that means. It means that I should request the Government. It is one thing for me to make recommendation and to see that Government takes action but it may be quite another matter for Government to approve. It will do no harm for me to do this. I hope this will be taken up by the Government. But I want to see something done along with this line in our own home. I am extremely glad that this resolution has been moved at this juncture. As you know, one of the activities of the Serum institute is to manufacture serum for Rinderpest. You also know that we are not making one-fifth of what we were doing three or four years ago. So we must attend to this task more briskly. I shall now put this resolution to vote.

Mr. Manickaraj :—Some of the officers of this department had some three years ago the ambition to undergo special training in the Serum Institute. The previous Superintendent did not want them to do so.

President :—You must know that times have changed. I am not referring to the personnel. Actually conditions have changed since then. Probably it was impossible to take up men for special training in the institute because probably adequate facilities were not available then.

The resolution was put to vote and unanimously carried.

11. "*That the Director of Agriculture be requested to kindly reconsider his views with regard to the change of designation of Veterinary Inspector to that of Veterinary Surgeon.*"

Mr. K. R. Ramachandra Rao in moving the resolution spoke as follows:

Gentlemen,

I need not say anything more about the resolution than what is already contained in it. For the last four years this resolution has been brought forward before this house and somehow it has not been brought to the notice of the Director at all. There has been a great discussion in this matter year after year. The year before last, the

Director mentioned that the resolution might be left to himself. The designation "Veterinary Inspector" has been continuing since the department was started in the State. Inspectors of the Glanders and Farcy Department in Bombay have just their particular work to attend to. But in this State it is not so with the Veterinary Inspectors. In fact they are doing in the State most difficult portion of the work. In Bombay, administrative work is prevalent and hence the designation "Inspector" fits in well. But here we are doing more of professional work and we should like to be called Surgeons. I do not know why this should not be done here. This does not cost anything extra to Government. Sir, you can understand how much humiliated we feel in village parts to be called Inspectors. We are grouped among Panchayat Inspectors. When our department was reorganised, you were away in your home. Now what we crave from you is to change our designation to "Surgeons." We are not asking for higher salary and higher emolument from Government. If a precedent is needed, it is available in British India. My only view in the end is that a spade should be called a spade not a *gudli*. (Pick-axe).

Mr. K. Srikantiah seconded the resolution.

Mr. M. S. Sastry :—Nowhere in British India the subordinate service men are called Veterinary Inspectors. They are called Veterinary Assistant Surgeons. We are doing more of doctors' or surgeons' work. Therefore to adopt the name "surgeon" is quite reasonable and it has been done so in almost all the British Provinces. You may say that in the Medical Department, they are called Assistant Surgeons. But Mysore is leading the British Provinces and the Indian States in several matters. Why not the Mysore Government start the designation "Veterinary Surgeons" and lead other provinces? As such I hope that this resolution will, not only have the unanimous support of all the people here but also have the hearty support of the Chairman.

Mr. N. Krishna Iyengar (*Assistant Superintendent*). :—In the Medical Department they were formerly called Hospital Assistants and later on they were called Sub-Assistant Surgeons.

President :—This subject was discussed two years ago. I have not before me, nor in my mind, anything to tell me what I said on that occasion. I am not prepared to contradict you in what you are saying about me in this connection. I have a faint recollection that this matter was discussed two years ago. My memory is when you were asked whether you would like to be called Veterinary Assistant Surgeons, you said you would prefer to be called Veterinary Inspectors. I think that was the reason why I did not take any action.

The only precedent we think of is this precedent, *viz.* the term in the Medical Department of Assistant Surgeon. This you were not willing to have. That very well tied my hands. Now I want again to say what I said two years ago. I come from a very democratic country and these titles and designations do not count there. I do not care what they call me. I will be satisfied as long as they pay me all right and give me the work I like most to do. Also I admit that different countries have different conditions. The idea of sticking much to designations is very prominent here. I shall now say that I will give my serious consideration to this resolution, but I am not going to say anything more than what I said two years ago.

Mr. Sampathkumaran:—We have got to move in villages and our designation sounds very low to villagers. We get our pay all right. When the public is taken into consideration, our situation is quite different. It is only on account of this that we are fighting so much for a change in our designation. In India we have not got a democratic feeling yet, as it is in your country.

President:—I have had no complaints from the Agricultural Inspectors. They seem to be able to get on with their work all right in villages. I do not think they are held low. Might I just mention one other thing? You have a long tradition behind you. These twenty six years you have been Veterinary Inspectors. I do not like to change it now. All right. If yout persist, I will give my serious attention to this resolution.

Mr. K. R. Ramachandra Rao:—The Government have given the designation "Veterinary Assistant Surgeon" in British India because an M. R. C. V. S., is at the head of the department. He wants to call himself a Surgeon and so the designation "Assistant Surgeon" is prevalent there.

President:—You may call yourself "Veterinary Surgeon" on your visiting card. But it is quite another matter for the Government to call you "Veterinary Surgeons."

The resolution was put to vote and unanimously carried.

Dr. Leslie C. Coleman, M.A., Ph. D., C.I.E., spoke as follows in his concluding remarks:—

Mr. Krishnaiengar and Gentlemen,

I hope you are not expecting from me a long speech this morning. I got back only yesterday afternoon rather late after two very strenuous days and I have had no time to prepare a speech. Perhaps, it is fortunate for you. What was presented to me last night was Mr. Krishnaiengar's remarks read out to you this morning.

In the first place, you have been very kind to me in inviting me to preside at this meeting and I appreciate the honour you have done me. Also I am here as the official head. This is the one opportunity that you have in a year to bring in a body your views to my attention. My great regret is that I shall not be able to attend the afternoon session when you are to read your professional papers and to discuss them. That to me would be very interesting and enlightening. It should certainly be more educative than this morning's discussion.

You have already been informed that of your three resolutions that were passed at your last annual meeting, two have been accepted by Government. The other was not accepted by Government though I remember it was sent up with my recommendation. So you see it is one thing to pass a resolution here and get my approval of it. It may be quite a different thing to get Government's approval, especially when the question is about spending more money.

Gentlemen, I must confess that the case would be distinctly stronger for taking up with Government the question of a subvention for your Association if it were not for the fact that we have just heard this morning that less than 50% of you have actually paid up your subscriptions, *i.e.*, that less than 50 per cent. of you are supporting your Association. It is going to be extremely difficult under the circumstances for me to ask Government to help you with the subvention unless you are able to show a greater amount of support among yourselves.

Your Association has two functions and if one can judge from the resolutions, the function that is emphasized is the professional function, not the professional function in the way of its work but the Trade Union function. Of the three resolutions that you moved last year, two had to do with either the Association as an Association or your own personal affairs, and one had to do with the actual work of veterinary service to the State. I am very glad that one of the resolutions had to do with the latter. I should like to see the time come when out of the three resolutions discussed here at least two would be with reference to the improvement of the work in the State and only one with reference to your personal affairs.

The question of private practice is one, which the Government considered during the year, and in placing that question before Government I did so with a certain amount of reluctance. Gentlemen, we have had unpleasant instances in the past, where complaints have been made that officers have demanded payment for service to the ryots which should be free. It is probable that most of these

complaints are false, still the suspicion must remain that this does occasionally happen. Under the new Government order, the danger of this complaint increasing is a very real one. But you can see that now that you are permitted to have private practice really very heavy obligation and responsibility rest upon you, if you wish to keep your profession clean. That is the reason why the Government has sanctioned this concession for a period of one year only:— This continuance of the concession depends entirely upon you. I for one personally should like to see the day when no veterinary aid goes without proper remuneration. In my own country when a man has a sick horse or an ailing cow to be attended to by a veterinarian, he has to pay for the Veterinary doctor. I should like to see the day when the same conditions prevail here also.

I quite remember the day when there was a strong feeling that castration work should not be entrusted to any but a veterinarian. I am extremely glad that the question of training villagers was brought to the attention of Government by you. This will be a matter of great importance as time progresses, because I still hope to see the day when 400 or 500 breeding bulls are supplied to the villages each year. Any such distribution must go hand in hand with the castration campaign, and I am glad that this Association has realised that the co-operation of the villagers must be obtained in connection with such a campaign.

As regards your work, we already know that Rinderpest has become a very much less important matter than it was three or four years ago. Notwithstanding this result, it would be out of the question to think of closing down the Serum Institute simply because we have for the time reduced the incidence of Rinderpest to an almost negligible proportion, as the President of the Association has remarked. Leaving Rinderpest out of consideration, you have got a very wide field to traverse. The sera prepared for combating diseases other tnan Rinderpest, are in most cases not yet as effective as they ought to be. That means that there is a lot of original work to be done, a lot of improvement to be made and that ought to be done in the Serum Institute. We should not have to wait to hear from Muktesar or any other place with regard to what we have to do at present. Problems connected with diseases of sheep have hardly been touched and the losses are very heavy. This undoubtedly is one of main obstructions to the improvement of sheep in the State.

You referred to the question of milk and meat inspection. Personally I think they are important. Anything that I may possibly do in the way of attracting the necessary attention of the Local Bodies to this matter, I will do. You, however, should be able to do

much more than I in this connection, as I am not very familiar with City population.

I have not seen the proceedings of the Representative Assembly, but I believe the Dewan in his speech has held out hopes for the increase of the number of Veterinary Dispensaries in the State. I do not know whether he came down to figures or not. Anyhow it means there will be an increase of Veterinary Institutions in the State during this coming official year and it means some slight alleviation of the serious conditions that exist now, *viz.* conditions of unemployment among the trained veterinary youngmen. I learn from the Superintendent that there are already 18 on the waiting list. Government in some cases has spent fairly large sums of money and in other cases the young men have spent their own money, but, after training they find absolutely no scope for utilisation of the training they have received. This is a matter which I regret most deeply. Nobody could foresee the financial conditions existing now in Mysore. Four or five years ago, Major Simpson took up the question of training young men along this line that we should at least have one trained man in every taluk. There are 20 taluks not yet served with Veterinary Inspectors. We hope that a few more Veterinary Institutions will be opened and that means a few more of these unemployed trained men will get the opportunity for utilising their knowledge.

Gentlemen, I have given you rather a rambling talk. Once again, I thank you for the honour you have done me. I hope you will have a very interesting discussion this afternoon and to-morrow morning and I wish you all success that is possible under the present conditions.

The second day's proceedings commenced at 11 A.M. with the business meeting for the election of office bearers for the next year. The following were elected as members of the Managing Committee :—

K. Krishnaiengar Esq., President (Ex-officio)
Subedar T. V. Manickaraj, Vice-President.
S. D. Achar, Secretary.
K. Ranganatha Rao, Treasurer.

Mr. P. U. Nayar,
,, K. R. Ramachendra Rau,
,, M. Subba Rau,
,, K. Srikantiah,
,, B. V. Venkatachar.
} Members.

This over, a few of the professional papers were taken up. There was a lively discussion on some of the papers, and the house adjourned for tea at 1 p.m.

Tea over, the members reassembled in the Hall after a short meeting and after discussion on some of departmental subjects, the meeting dispersed with the usual vote of thanks to the President and Visitors.

During the evening Mr. S. D. Achar, treated all the Members and Visitors to a sumptuous dinner at his residence, "Ranga Prasad" Chamarajpet.

PAPERS READ :—

1. Principles and Problems of Immunology. — by S. D. Achar Esq.
2. A note on the recent field experiments with "Goat Virus" alone in Amrit Mahal Herd at Arsikere. — „ P. U. Nayar Esq.
3. Vaccination against Rabies—a comparison of Mulford Single Vaccine and the Coonoor Vaccine. — „ H. P. Kulkarni Esq.
4. Experiences after S. S. inoculation during Rinderpest outbreak, at Honnali. — „ K. R. Ramachendra Rao, Esq.
5. A note on the preparation and standardisation of B. Q. Filtrate. — „ V. S. Kuppuswamy Mudaliar, Esq.
6. An Unusual case of Black-Quarter. — „ K. J. Subramanyam Esq.
7. Canine world and its management. — „ P. Veda Bhatt Esq.
8. Tramatic pericarditis in a bullock. — „ S. G. K. Iyengar Esq.
9. A case of milk fever in a cow. — „ K. N. Kailasam Esq.
10. Some post-mortem lesions —a discussion. — „ K. N. Subba Rau Esq.

Communications.

TO THE EDITOR,
The Indian Veterinary Journal, Madras.

Dear Sir,

I shall be very thankful to you if you will please allow me a few lines of your esteemed paper for the publication of the enclosed resolutions passed at the Condolance Meeting of the Veterinary Assistant Surgeons and Veterinary Inspector of Etwah District, held on the 13th August 1933, on the death of Capt. S.G.M. Hickey, M.R.C.V.S., Director of Civil Veterinary Department, U. P.

Yours truly,

ETWAH,
15th August, 1933.

MOHD. ISHAQ,
Veterinary Inspector, President of the Meeting.

A meeting of the Veterinary Assistant Surgeons and Veterinary Inspector of Etwah District, was held on the 13th August 1933, at 5 P.M. The Veterinary Inspector presided.

(1) "*The meeting recorded (all standing) its deep regret at the sudden and untimely death, on the 1st August 1933, of Capt. S. G. M. Hickey, M. R. C. V. S., Director of Civil Veterinary Department, U. P.*"

(2) "*The meeting further resolved to convey to Mrs. Hickey and other relations the deepest sympathy with them in their bereavement.*"

TO THE EDITOR,
The Indian Veterinary Journal.

Sir,

Please publish the following in your valuable journal and oblige.

CONTROL OF STRAY DOGS—A NECESSITY.

Among the domesticated animals, dogs are considered to be true friends of man. Their fidelity, obedience and love towards their masters are well-known. The peculiarity of their affection towards their owners is usually steady and everlasting. Whatever the position or rank of the owners may be, dogs remain faithful to them to the last. Not only are they the fine companions of man, but they

are also ever ready to welcome friends, to defend when opportunity occurs and to protect the person and property of their owners. There are many stories told about the usefulness and faithfulness of dogs in both ancient and modern literature. It is a well-known fact that dogs were kept in olden days by monks in the mountains in their monasteries to guide, and rescue travellers passing through dangerous valleys, &c. In modern times dogs have been trained and used for military operations and for detective purposes by the police. The splendid services they rendered during the "Great War" are still fresh in our memories. The usefulness of these animals is so much appreciated in Western countries that people have taken breeding of dogs as a hobby and business. The enthusiasm, the energy, the time and money they spend in breeding and rearing different types of dogs is wonderful and it is only the well bred dogs that please the owners.

In the East however, there is a large number of stray dogs which behave more as animal scavengers than anything else. A control on these dogs in India is a real necessity at the present moment. In all civilised countries, it appears to be a public health problem. One of the most dangerous diseases that human beings can contract from stray dogs is Hydrophobia. It is therefore a very urgent problem that should be vigourously tackled by the Public Health authorities in India. Efficient control of dogs by compulsory registration and destruction and impounding means rapid disappearance of rabies from any country. England, Australia and New Zealand have been freed from rabies only by the above methods.

It would not be out of place to mention, for the interest of readers, a few words as to how and what measures have been adopted to get rid of stray dogs from the Town of Penang, a fine beautiful place noted for its sanitation. Dog keeping in Penang is not an easy affair as in India. All dogs above the age of three months have to be compulsorily registered and a register is maintained for the purpose at the Animal Infirmary showing the name and address of the owner. All dogs should have the registration badge fastened to the collar. Any dog found out of doors without a badge is shot or impounded as the case may be. If both cannot be done, the dog-shooter who is employed for this purpose will follow the dog to the house and see the owner and make a report to the Municipal Veterinary Surgeon or his Deputy for action. Certain Officers of the Municipal Veterinary Department are authorised to enter into the compound or premises of any house for detecting unlicensed dogs.

Recently two persons were summoned for the offence of keeping unregistered dogs and fined twelve dollars each by the Police Magistrate.

A dog can be registered only in the name of an individual person and the registration badges are not transferable. The license fee for a dog or a slut was $ 1-50 (nearly Rs. 2-8-0) per year, but now the fee for a slut has been raised to $ 5 (Rs. 7-8-0) with a view prevent dog to breeding, for obvious reasons.

If, in the opinion of the Municipal Veterinary Surgeon, a dog is not properly looked after, or is suffering from any incurable disease registration of such a dog may be refused. Any owner, if requested to do so by the Municipal Veterinary Surgeon shall produce his dog for inspection at the owner's residence or at the Animal Infirmary. If a dog is suffering from skin diseases, the owner shall have to secure the dog and notify to the Municipal Veterinary Surgeon who may direct the dog to be treated at the owner's expense either at the Infirmary or in his own house or direct him to have the animal destroyed. Any dog found out of doors suffering from skin diseases may be impounded or dealt with or may be destroyed. Any unregistered dog found in any public buildings or places may be seized by any person and taken to the Infirmary where it may be disposed of. Contravention of any of these bye-laws shall render the owner of the dog liable for conviction to a fine of $ 25 (Rs. 37-8-0). The above bye-laws are enforced very stricly and vigorously by the officers of the Municipal Veterinary Department. Registration, control and destruction of dogs are mainly in the hands of this department, who engage dogshooters to petrol all over the town to carry out the work As a result of this, the town at present is absolutely free from miserable-looking, mangy and emaciated dogs. If this sort of a system is followed by the District Councils, Municipalities and Corporations in India, it would be good to dogs in general and for human-beings in particular.

Yours faithfully,

M. V. PILLAI, G.B.V.C.,
Penang.

PENANG,
17-7-1933.

To THE EDITOR,

The Indian Veterinary Journal, Madras.

Dear Sir,

Owing to my transfer from Anantapur to Tiruvallur Rural Development Scheme, the Office of the General Secretary of the All-India Veterinary Association has been shifted from Anantapur to Tiruvallur.

All communications to the Association may be addressed hereafter to Tiruvallur Post, (Chingleput Dt.).

Tiruvallur, (Chingleput), 20-7-'33.

Yours faithfully,
M. S. SASTRY, G.B.V.C.,
Veterinary Assistant Surgeon, Rural Development Scheme, Tiruvallur P.O., (Chingleput Dt.), General Secretary, "The All-India Veterinary Association."

TO THE EDITOR,

The Indian Veterinary Journal, Madras.

Dear Sir,

Please publish the following news in the columns of your valuable journal and oblige.

Capt. D. P. White, M. R. C. V. S., Government Veterinary Surgeon, Perak, proceeded on furlough and his place was taken by Mr. W. R. Wallace, M.R.C.V. S., Government Veterinary Surgeon, Penang.

Mr. B. D. Mehta, G.B.V.C., Assistant Government Veterinary Surgeon, Penang, is appointed to act as Government Veterinary Surgeon, Panang, vice Mr. Wallace transferred to Perak.

Mr. A. R. Kuppuswamy, G.B.V.C., Government Veterinary Inspector, Penang, and stationed at Bukit Mertajam, proceeded on combined study and vacation leave of nine months to Madras and his place has been taken by Mr. A. Joseph, G.B.V.C., Veterinary Inspector, Penang, and stationed at Butterworth in addition to his own duties.

Mr. P. C. Short, M.R.C.V.S., Acting Principal Veterinary Officer, S.S., and F.M.S., stationed at Singapore was granted leave prior to retirement and his place was taken by Mr. George Rocker M.R.C.V.S., Government Veterinary Surgeon, Singapore, in addition to his own duties.

Mr. Purvis, F.R.C.V.S., Government Veterinary Surgeon, Malacca and Negri Sembilan is granted 11 months' half pay leave on medical grounds and his place was taken by Mr. Stanhope, B. V. Sc., M.R.C.V.S., Government Veterinary Surgeon, Selangor, in addition to his own duties.

Mr. Purvis will go to Switzerland to recouperate his health.

PENANG, *September 19, 1933.*

Yours faithfully.
B. D. MEHTA. G. B. V. C.

Extracts.

MADRAS UNIVERSITY.

Academic Council Meeting.

An ordinary meeting of the Academic Council of the University of Madras was held this morning at the Senate House, Chepauk, Sir K. Ramunni Menon, the Vicc-Chancellor, presiding.

DEGREE FOR VETERINARY SCIENCE.

Dr. A. Lakshmanaswami Mudaliar, moved that there be instituted in the University a degree in Veterinary Science called " B. Sc. Veterinary."

He said that he had great pleasure in asking the Council to approve the motion. After the Linlithgow Commission and its report, greater interest in agricutural matters were being evinced in the country. There had been a a demand for a better class of Veterinary Surgeons. He hoped the degree would be instituted in 1934 and that the Madras Veterinary College, which had an old reputation would soon be affiliated to the University. The question arose from the Director of Veterinary Science, who devised the institution of a degree course in Veterinary Science in the University and for recognition of the Veterinary College as an institution for preparing students for the degree examination. The Syndicate appointed a Committee to consider the subject. The Committce reported that a Degree course be instituted.

The motion was accepted. The question of framing regulations for the degree was adjourned to the next meeting of the Council.

"The Hindu," Madras, August 28, 1933.

RINDERPEST MENACE IN C. P.
Cattle Diseases Bill To Be Introduced In Council.

The Province does not breed cattle in large numbers and the local supply has to be augmented annually by the importation of a large number of cattle from the States on its northern borders and rinderpest is a great menace. The necessity of regulating the importation has often been urged upon Government both by the Veterinary Officers and the Board of Agriculture, and the Royal Commission on Agriculture recommended legislation to deal with the problem comprehensively.

As the problem is urgent and an All-India measure may take time to enact, the local Government has decided to undertake provincial legislation and Dr. P. S. Deshmukh, Minister, will introduce a Bill, called the Cattle Diseases Bill in the forthcoming session of the C. P. Council.

The object aimed at is to make compulsory the vaccination against rinderpest of all imported cattle at stated quarantine posts and to take power to prohibit or disperse a fair or market in or order to prevent the outbreak or spread of any infectious or dangerous cattle diseases. Owing to some valuable reasearch work a cheap and effective method to check rinderpest has been found out.

" The New Times " 17—5—33.

GRAVE INJUSTICE.

Sir,—For days past the Madras Public Services Commission advertised in the dailies for applications to fill up thirty posts of Veterinary Assistant Surgeons. There are now about seventy Veterinary graduates waiting for appointments. There is no scope in this line for private practice in the country. This notification filled the hearts of these waiting men with some hope and relieved them of the despair into which they had fallen. A good many have sought for application forms and had been preparing to get the requisite good conduct and medical certificates. The notification did not say that the applicants should be of any particular caste or creed. It is now learnt that the applicants must be other than Brahmins. The Veterinary College, when it trained these men, did not notify that the Brahmins would not be employed in the department. These graduates had spent three years in the College at Madras and have incurred heavy expenditure. Now, to say that Brahmins will not be employed means the ruin of forty young men who had not only spent money but have undergone a very stiff training in the College. They would have saved all this money and their time if they had been told that they would not be employed.

The ordinary public does not notice these systematic acts of injustice perpetrated by the Ministry. Five years ago a Ministry, started the communal rotation in the Services and the first department to come under the curse is the Registration Department in charge of a Minister—a Tanjorean. Having taken that feat of injustice, the first step in the inequitous course, it was easy to get the other departments in line. Now in the present case, even if the rule of commuual rotation was observed, out of the thirty posts to be filled up only 5 or 6 would be Brahmins. It is too much for the present Ministry to throw this small quantity of crumbs to the hungry graduates? Some of these veterinary graduates, who are taboo, have taken their degrees in Arts in the Madras University and the others have passed the Intermediate Examination. I wish the members of the Legislative Council to speak and demand equal justice to all and to take notice of this act of grave scandal. It may be too much for the Governor to act under the Instrument of Instructions which enjoins upon him the duty of seeing that no particular community, especially a minority community, is victimised. A notification declaring that no Brahmin will be appointed from date to any public post will be more honest and straightforward and the Brahmin will know where he stands. I would welcome heartily a notification declaring, as I have said above, that no Brahmin will be appointed to any public post.

" Hindu " 9—8—33.

MAYAVARAM, 5—8—33.

C. S. SUBRAMANYAM.

AGRICULTURE AND CATTLE.

Sir,—The rage for retrenchment in the expenditure in the Government of Madras seems to be confined to what are termed the nation-building activities and particularly what concerns the ryot. The ryot is practically helpless in the matter of curing his cattle in the case of any ordinary disease or accidents and much more so, if an epidemic breaks out as it usually does in certain months of the year. The old-time cattle doctor like the horse doctor in other countries has practically disappeared. The Veterinary Department professes to meet the wants of the ryot in the matter of healing, preserving and improving his cattle. It has always been said that castration of calves at an early age is necessary to prevent immature bulls covering cows and heifers. The Veterinary Surgeons that are now employed are in full time charge of dispensaries and hospitals or are attached to such institutions. The full-timed men in charge of the dispensaries do give relief within an area of a radius of three or four miles from the institution; the attached men are expected tot our in one or more taluks and attend to cases of epidemics when called upon to do so and also to treat cases in their tour. Taking the area of a taluk the number of villages and the number of cattle, it is too much for a touring surgeon to shed his beneficent work over the whole area. The number of cattle in the Presidency is in the neighbourhood of 23 millions. The number of Veterinary Surgeons employed is 270. This works out as 8,3 lakhs of cattle for one surgeon.

The policy of Government has been hitherto to add to the number of men and hospitals each year thereby increasing relief to the ryots' cattle. That policy has, I understand, been given a set back now. The loss of cattle by a ryot no doubt does not affect the finances of the Government directly but it cripples the ryot and makes him less able to withstand bad seasons and low prices. The high pitch of land assessment has to be reduced and the resent suspension of $\frac{1}{8}$ of the demand has come as a very welcome relief in the districts to which it was granted. This suspension of assessment is a visible positive help. It can be counted in figures and the sum foregone by Government is definite. There are other less visible methods by which the ryot can be helped. Agricultural advice, provision of better seed is one of that stamp. Improving of irrigation facilities, removing irrigation and drainage difficulties is another. The less visible or practically invisible but all the same the most important sphere of help to the ryot is the providing of the means whereby the sick cattle can be treated and cured and on the approach of epidemics, by quick and efficient methods, prevent his cattle falling a prey. This last, I consider, as important as any of the above if not more; because it tells upon the individual ryot very severely.

The Government has been maintaining a very efficient Veterinary College and it is turning out year by year smart and capable young men. These men are ready to work. They ought to be employed to do this work. It is not as in the case of medical men that these men can settle down in some stations and practice; for the ryot has not that amount of conviction as well as the resources necessary to seek and pay for the services of a Veterinary Doctor. It will take some decades, just as it has taken for the medical profession, for the veterinarian to be sought for in cases of cattle disease. Before the advent of the motor car, private veterinary surgeons carried on useful work; for there were horses and ponies and owners called them in not only in cases of disease but also in cases of shoeing. So there is no chance in the present advancing stage of machinery for a cattle doctor to eke out a living by private practice but if the people in large numbers get to know and are convinced of the benefits of trained veterinary aid, the time may come when the ryot in the village will go to a Veterinary Surgeon in cases of sickness of cattle. Therefore in order to give relief to the ryot and to make him thoroughly conversant with the benefits of trained veterinary aid, it is incumbent upon the Government to spend a little more of the money * it extracts from the ryot for his benefit.

In this connection I must say that a veterinary man residing in a place though not actually employed in the locality has been of great use to his neighbours and fellow residents. I have found sometimes men on leave have done very useful work for me. Municipalities should employ Veterinary Surgeons to be in charge of their cattle and also to inspect their slaughter houses. Very small municipalities may not afford to do so. Almost all the larger Municipalities should be enjoined by Government to employ Veterinary Surgeons to be in charge of their cattle and abattoirs. I understand that some Municipalities pay a small honorarium to the Veterinary Surgeon in charge of local dispensaries thus establishing the fact that the services of a veterinary man are necessary for those who keep a large stock of cattle. So, if Municipalities employ veterinary men for all these works, they may occasionally be useful to fellow-men and cattle even though they may not carry on paying private practice. I may also suggest that these Municipalities may allow them certain fixed hours to practice their profession for the benefit of the public. In these days when special qualifications are required for the sanitary services of the small municipalities, the suggestion of veterinary qualification seems to be very reasonable and heads of Municipalities should avail themselves of the present state of a large number of unemployed veterinary men.

* The amount of land revenue collected is Rs.7,68,05,400.

The allotment for the Civil Veterinary Department is Rs. 8,59,600.

This works out as 1·1 per cent. "Hindu" 7-6-33.

MAYAVARAM,
June, 4, 1933.

C. S. SUBRAMANIAM.

WAR AGAINST RINDERPEST

Discovery of New Virus.

Serum Institute, Bangalore, has now concluded the field and laboratory tests regarding goat virus inoculations to immunise cattle against *rinderpest*. It might be mentioned that Mysore was the first to adopt the serum-simultaneous method of inoculations to combat rinderpest among cattle which levied a heavy toll in Mysore hitherto. Though very encouraging results were obtained from this method, the Serum Institute worked hard to find out a less costly method. It was found that the serum simultaneous method being a double inoculation took much time; besides a large dosage had to be administered. It was also found that this method was attended with many serious complications, the serum being of bovine origin.

The goat virus is found to be free from such complications and the dosage administered is small and as effective as the serum-simultaneous. At first the unfixed goat virus was used, but later it was found to be more advantageous to use the fixed virus.

Severe tests were conducted to standardise the goat virus with a view to its issue to stations in and outside Mysore, where there has been a great demand for the Institute's products. The Amrit Mahal cattle and the various village strains of cattle were tested upon with the goat virus and the results achieved have been encouraging and conclusive.

The Institute has decided to release the goat virus in the near future as an effective minimising agent against rinderpest.

It is stated that the Mysore Serum Institute is the first to use the goat virus for combating rinderpest. —HINDU 14-9-'33.

Reviews.

Hoare's Veterinary Materia Medica and Therapeutics.—Fifth Edition. Edited and Revised by J. Russel Greig, Ph. D. (Edin.), M. R. C. V. S., F. R. S. E., Director, the Moredun Research Institute, Edinburgh; Hon. Research Professor in Animal Pathology in the Royal (Dick) Veterinary College, Edinburgh; Formerly Professor of Medicine and Materia Medica in the Royal (Dick) Veterinary College. Bailliere Tindal and Cox. 7 and 8, Henrietta Street, Covent Garden, London, 1933. Price 21s.

We are in receipt of a copy of the above book. This is the Fifth Edition and the previous one was printed in 1924. We have very carefully perused the book. It is written in three parts. Part I deals with Diagnosis and general symptoms of disease—The care, management, and nursing of sick animals—The actions and uses of drugs—Prescribing and prescription writing—The administration of medicines—Veterinary pharmacy, pages 1-103. Part II deals with Materia Medica—Vaccine and Serum Therapy—Biological tests, pages 104 to 367. Part III deals with the Therapeutics of: the Digestive system—Diseases of the liver—Peritonitis and Ascites—The urinary organs—Catarrhal affections of the respiratory organs—Diseases of the circulatory organs—Diseases of the nervous system—Certain specific diseases—Minor operative procedures—pages 368 to 460. In addition there are 3 appendices:—Pages 460 to 498. Appendix I deals with representative formulae for the more ordinary stock preparations—Appendix II gives a table of Thermometric equivalents and

another for the purpose of describing the sizes of cannulae and hypodermic needless—Appendix III treats about the law relating to dangerous drugs. A beautiful index closes the book—pages 499 to 510.

In a review of this book we cannot do better than quote from the preface written by the Editor. He says : " In the present book the general plan of the work conforms to that followed in the last editon. An attempt has been made to present part 1 in more concise and lucid form, and in revising and largely re-writing the section on Materia Medica I trust that I have been duly mindful of the now more clearly recognised claims of Pharmacology as the link in teaching curriculum between Physilogy and Therapeutics. The recent publication of a new edition of the British Pharmacopœia has occasioned numerous alterations in nomenclature and its formulæ. The section on Therapeutics has been almost entirely rewritten. Mr. Arthur Gofton has revised and extended the section on the Biological tests in clinical diagnosis and also the article on the care and management of the parturient cow—Professor Henry Dryerre has revised much of the text and collaborated freely on those aspects relating to Physiological Bio-Chemistry. Mr. Alexander Browlee has checked all the formulae and posology. Mr. W. S. Gordon has assisted in the preparation of the section on Vaccine and Serum Therapy. Mr. Norman Walker, Advocate, Lecturer on Jurisprudence, Royal (Dick) Veterinary College, has contributed the article on the Law Relating to Dangerous Drugs."

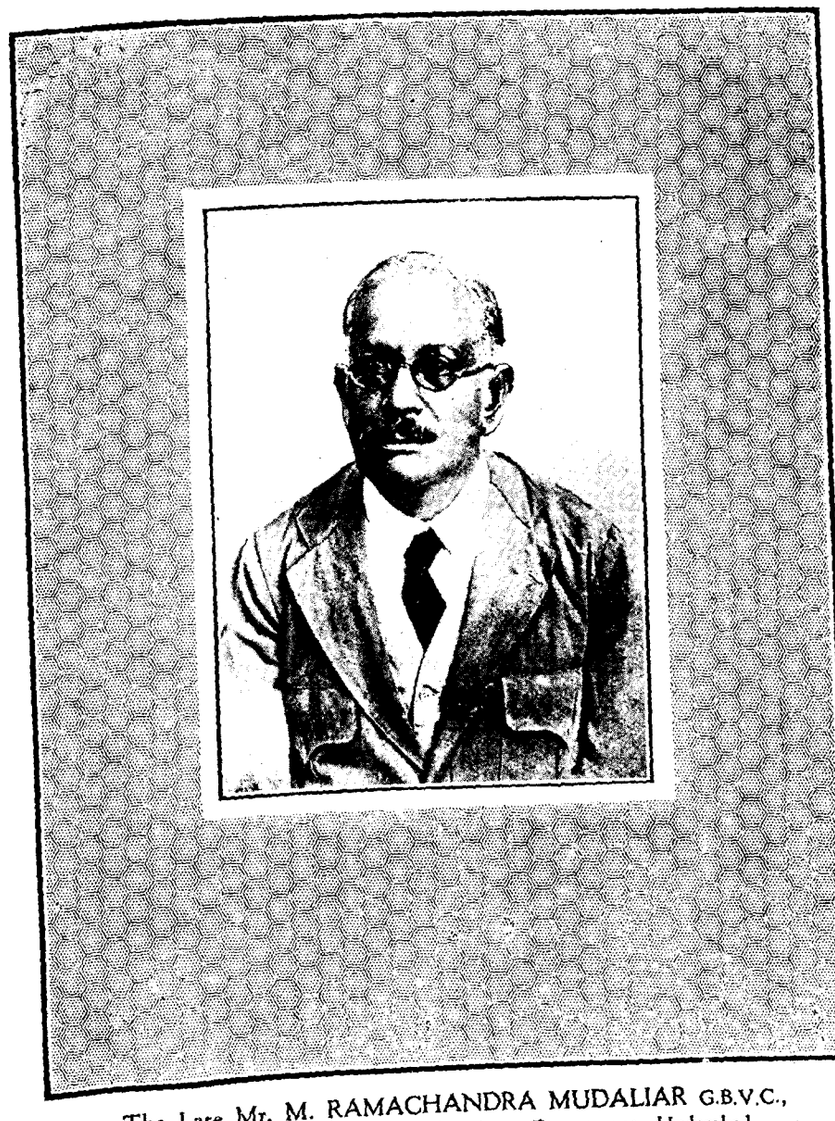
The book has been compiled with great care and patience and our hearty thanks are due to the Editor. We do not know of any single book which gives such clear and concise idea of all matters pertaining to the veterinary profession —matters worth knowing for every day work. We have always held that this book should be in the hands of every Veterinarian either practising the profession or studying. The greatest tribute to this book is that it is one of the text books in the Madras Veterinary College and if we are informed correctly in other Colleges as well.

M. S. N.

Veterinary Abstracts :—Editor, A. D. MacGregor, F.R.C.V.S., F.Z.S., I.V.S., Principal, Bengal Veterinary College, Calcutta.

We have much pleasure in welcoming a new addition to our existing veterinary literature in India. It is a quarterly journal called ' Veterinary Abstracts ' issued from the Bengal Veterinary College, Calcutta. As the name itself indicates the journal will present " a periodical series of interesting and helpful abstracts from selected current literature." We have not the least doubt that it is bound to meet " a definite want," which does exist amongst Veterinarians in India. The Editor is that great devoted servant of the profession, Mr. A. D. MacGregor, which fact is in itself an assurance beyond any doubt of the absolute success of the new venture. The journal is very neatly got up on art paper and the annual subscription of Rs. 3 indicates the good intentions of the Editor to keep it within the reach of all. We hope our readers will extend their patronage to the new journal, which it so richly deserves.

Annual Report of the Stud and Veterinary Department of H. E. H., The Nizam's Government, for 1340 Fasli.—The report records an all round progress. Efforts at falling in line with other Presidencies and Provinces are noticeable. With the proposed re-organisation, we hope the Department will be second to none in India.



The Late Mr. M. RAMACHANDRA MUDALIAR G.B.V.C.,
Retired Superintendent, Civil Veterinary Department, Hyderabad,
who died on the 4th August, 1933.

The Late Captain S. G. M. HICKEY, M.R.C.V.S., I.V.S.,
Director, C. V. D., U. P. (India) who died on 1st August, 1933.

Obituary.

FAMILIAR FACES VANISHING INTO THE VOID.

We are deeply grieved to record the sad demise of a number of Veterinary Surgeons in this issue. "Fell Sergeant strict in his arrest" has been unusally busy in our ranks this year. First and foremost we were shocked to hear of the sudden death of Capt. S.G.M. Hickey, M.R.C.V.S., Director, Civil Veterinary Department, United Provinces, of heart-failure on the 1st of August 1933. He has been cut away in the prime of his life and when Mrs. Hickey was away in England, which makes the grief all the more poignant. Entering the Indian Veterinary Service in 1912, he served in Central Provinces and later on in United Provinces. Excepting for a period of nearly two years when he served in the Great War, the best of his labours was in United Provinces, where he rose to the position of Director of Civil Veterinary Department and continued to hold that post until the hour of his death. He died virtually in harness doing his duty to the very last hour. He was a just, noble and kind officer who was popular in all quarters. We offer our heart-felt condolence to Mrs. Hickey and other members of the bereaved family.

Mr. M. RAMACHANDRA MUDALIAR.

Retd. Superintendent, C.V.D., Hyderabad.

Equally distressing is the news of the death of Mr. M. Ramachandra Mudaliyar, who retired from service only very recently. It is a pity he was not spared to enjoy his well earned rest. It was only in our January issue of this year we announced the retirement of this distinguished colleague with a life sketch by a correspondent. We never thought that his voice would so soon be hushed in the great silence. Our heart-felt condolences to the members of his bereaved family.

Mr. C. V. VENKATESWARA AIYAR, G.M.V.C.

Our grief is too deep for words at the demise of this young man. Our heart goes out in sympathy with the members of the bereaved family.

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EDITED BY

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

Veterinary Surgeon, Madras, South India.

Office :—26, Wallajah Road, Mounr Road,

MADRAS.

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