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EDITORIAL.

PROFESSIONAL STATUS.

In the last issue of the journal a correspondent expresses the view, with which we are in cordial agreement, that the greatest needs of the profession in this country are an enhancement of professional status and an improvement in professional etiquette. He goes on to remark that the remedy, as he sees it, rests with the profession as a whole, through its official organisation, and not with its individual members. In regard to this, we are not able to see entirely eye to eye with Mr. Viljoen, although we have no doubt that much of his criticism is of great value and should provide food for thought on the part of the Board and the Council.

To our mind, however, the cure of the evils mentioned does rest with the individual. It is of course for the profession to see, so far as lies in its power, that it is composed of such individuals as will be amenable to a spirit of co-operation and decent conduct without which our organisation cannot fail to appear undignified to outside eyes and without which the profession is bound to be handicapped in its struggle to throw off the taint of its admittedly lowly origin.

To put it plainly, the fundamental issue in our opinion depends on the type of student that veterinary science is able to attract and the training he receives. In this matter, unfortunately, the profession as a whole has had little to say, and further it is doubtful what weight, if any, would have been attached to such views as it might have expressed.

At the time of writing, the Principal of the University of the Witwatersrand has emphasized an evil in professional training from which, it is not hard to see, the veterinary profession has suffered quite as much as any other calling, namely the prevalent idea that professional training is the be-all and end-all of the qualifications which make a man an asset to his profession, and that questions of cultural refinement receive absolutely no stress. It appears impossible, in view of present-day economic conditions, to demand a higher standard of general education than the recognised University entrance examination before a student embarks on his professional training proper. We should all like to see the ideal of a degree in arts or science made an essential preliminary to veterinary study. Whether the student subsequently intends to proceed to scientific research or practice, the value of such

preliminary cultural development cannot be overrated. But an extension of the period of university life to seven or eight years is hardly within the bounds of practical feasibility, and the only other way of remedying the defect mentioned would appear to be to ensure that during his five year course the student comes as much as possible into contact with influences that may be relied on to broaden his outlook and develop his sense of values. Such an influence for his good may well be exerted unofficially by those members of the teaching staff of the Faculty of Veterinary Science, who can bring themselves to realise that there is something in education over and above the dictation of so many hundred pages of notes, the contents of which are expected to return boomerang-like to the teacher when the examinations come round.

But is an improvement in this direction likely to be realised under present conditions? Is the lecturer willing and able to make this contribution to the moulding of the character of our future professional colleagues, and is the student favourably situated to respond to such influence? Unfortunately there can be little doubt that these questions cannot receive an enthusiastic assent. To the contrary, we find that the teachers are without exception busy men, whose ambition must perforce be very different from that of being a successful teacher. They are public servants and as such suffer as much as any third grade clerk in the civil service from the disability of lack of intellectual freedom and independent action, and above all they are not men who earn their livelihood by the practice of veterinary surgery; while the student in this country has the doubtful advantage of residence on a government farm with a minimum of social and cultural contact for four years of a most impressionable part of his life. Before the importance of this spiritual side suffered by our students is said to be exaggerated, let it be asked specifically — how many of our students are members of a decent library? How many are able to attend a debating society? How many ever attend any form of entertainment more spiritually elevating than a bioscope or a dance? We know perfectly well what the answer to these questions are and small blame attaches to the students themselves. To put it bluntly, opportunities are greatly lacking for our veterinary students in all directions save the one of amassing as much as possible of technical knowledge in a minimum of time.

It is not that we have not the material on which to work. If the bursary evil is not revived, there should no longer be any essential obstacle to the fulfilment of the ideal that the type of student attracted to the study of veterinary science should represent the cream of the country, except that the conditions of the study themselves are unattractive and that veterinarians themselves are so lacking in confidence in the profession and its future that, when approached by young men inquiring about the advisability of embarking on the course, they

invariably (in our experience) consider the welfare of the inquirer rather than that of the profession and reply quite honestly and candidly that they are unable to recommend veterinary science as a career to the young South African. How many members of our Association have advised their own sons to qualify as veterinarians? Surely this is a crucial test of the point under discussion.

It is high time that the profession ceased to cite extrinsic conditions and ill-luck as causes for the position in which it finds itself. Must we always be the bad workmen who blame our tools? Or cannot we rather honestly face the fact that the status of the profession is no more and no less than the status in the eyes of the public that its individual members deserve by virtue of their qualifications as useful and agreeable members of society. If we do this, and act on it, we should as the years go by hear less of breaches of professional etiquette on the part of members and lack of confidence in the value of the veterinarian on the part of the stock-owner.

During the 12th International Veterinary Congress in New York a feature of the ladies' entertainment program was a visit to "Playland" to view the fireworks. Incorporated in the group of set-pieces was a specially constructed one "Welcome I.V.C." This is the first time in the history of "Playland" that such recognition has been given to any organization.

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DOURINE OR SLAPSIEKTE.

A preliminary report on its occurrence in equines in Griqualand West, Boshof, and Jacobsdal Districts.

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INTRODUCTION.

Although dourine is one of the most important diseases to which equines in South Africa are subject, great difficulty is experienced under our field conditions in recognizing the malady definitely in its initial stages. The complement fixation test was therefore introduced to arrive at an early diagnosis, which is very essential for the proper control and ultimate eradication of the disease. The observations to be described are to some extent based on the results obtained from the serological tests carried out at Onderstepoort under supervision of Dr. Robinson, who has had an unrivalled experience in interpreting the test in South Africa.

DEFINITION.

Slapsiekte (Dourine=unclean coitus) is a disease of horses, donkeys, and mules caused by a specific organism, *Trypanosoma equiperdum,* which under natural conditions is chiefly transmitted from stallion to mare and *vice versa* by coitus. Its course is usually chronic and it manifests itself by inflammatory changes in the genital tract, plaques, oedema, paresis or even paralysis of certain muscle groups, and cachexia.

HISTORY.

Undoubtedly a disease in equines, diagnosed later as dourine, was known to farmers in the Griqualand West Area for several years before it was brought to the notice of the Department. The earliest report to the Veterinary Division of its occurrence dates from February 1914, and in July of that year Lyons, on the instructions of the Principal Veterinary Officer, proceeded to the Herbert District to investigate the disease. He concluded that 1) the disease was principally confined to mares, although information was obtained to the effect that one stallion had died of it; 2) not all the mares on the same farm contract the disease; and 3) cases do not occur on every farm in the same locality. According to Theiler, although Andrews was the first to suggest the diagnosis of dourine, definite proof of its existence was only established four years later. The trypanosomes were then seen in a

bloodsmear taken from a puppy into which the blood of a suspected mare (a clinical case) had been injected six days previously. Similarly the disease was definitely diagnosed in South West Africa towards the end of the year 1914, although its existence was suspected at the beginning of that year (Maag).

In 1917, serum collected from affected animals and from those in transmission experiments was submitted, together with the serum of four control animals, to Dr. Watson of the Veterinary Research Laboratory, Lethbridge, in Canada, who may be considered to be an authority on the complement-fixation test for dourine. The return given by the Pathologist of the institution, in the absence of Dr. Watson on military duty, was positive in all the clinical cases as well as in three of the transmission lot, and negative in the control animals. The results of the complement-fixation test thus supported the diagnosis of dourine arrived at from epizootological, clinical, and anatomical-pathological evidence.

Owing to the outbreak of the World War and the consequent depletion of the staff any further local investigation had to be suspended for an indefinite period. After the abatement of hostilities, dourine was lost sight of for some time, diseases such as scab in sheep and East Coast Fever claiming the whole attention of the Department. In the meantime good work had been done by Veterinary Officer Buck, stationed at Kimberley, in eliminating clinically affected animals on a number of farms; but in spite thereof the disease gradually spread, involving the whole of Griqualand West, parts of Bechuanaland, and of the Transvaal, Free State, and South West Mandated Territory.

Towards the end of 1931 the disease had assumed such serious dimensions that it threatened to become a real menace to horse-breeding in South Africa. The Veterinary Division therefore decided on more rigorous methods of control, and the application of the complement fixation test, which proved to be of such value in the control of this disease in Canada, was adopted as a routine measure. Animals with a "latent" infection, which formerly evaded observation, could now be easily detected and dealt with in a satisfactory manner.

During the following year the "Dourine Campaign" was taken up in earnest within the above mentioned area. Some setbacks—the outbreak of goat mange in the Hay District and of foot-and-mouth disease in the Koedoesrand—had to be contended with, delaying the work considerably, yet it was possible to submit over 15.000 blood samples, involving 4,000 to 5,000 equines, to the Research Division for examination up to the end of June 1934.

Origin and Spread of the Disease.

Nothing definite is known about the source of dourine in these areas. Presumably the disease was introduced either from Canada with

donkey jacks or by transport animals from German South West Africa during the Herero wars. Mr. Vertue of Monasifontein, Herbert District, states that the first case of dourine seen by him was on the farm No. 404 in 1906. The animal in question was a mare owned by a certain Mr. Jacobs, a transport driver, who had just recently returned from that territory. It is of interest to note that dourine occurred in epizootic form in Germany during the same year (Knuth and du Toit, Schilling) and probably these infections may be related to each other.

Owing to our modern transport facilities (bridges and trains) and the lack of natural barriers (rivers and mountains) in this area, dourine may spread to any part of the Union and undoubtedly exists in some areas unknown to the Department. In this spread the natives, the farmer, and the speculator may play an important part.

The native often makes use of mares and stallions for riding purposes, as such animals with their progeny form a portion of his worldly wealth. On this account the disease obtained a firm footing in the unfenced native reserves where the animals are allowed to run freely (contact with infected animals can be readily established) and spread to the adjoining farms occupied by Europeans. During certain seasons, large areas are traversed on horseback by natives, whose chief occupations are those of sheep-shearing and maize-harvesting. While staying on a farm they are prone to have their mares served by the stallion of the farmer without obtaining his consent. In this way the infection may be carried from one farm to another.

The farmer is an important factor in spreading the disease. An individual may, instead of reporting a suspicion, or sometimes even without suspecting the disease, dispose of an unthrifty animal either by giving it to a native in lieu of wages or by selling it for what it will fetch. In search for grazing he may, during droughts such as that experienced in 1933, move his horses over large stretches of country. New pastures may be obtained on a farm adjacent to infected areas and he may even camp for a night on a quarantined farm. On his return some time after the summer rains have fallen, a disease unknown to him breaks out among his horses. Thus an infection may be introduced into a district not contiguous with an infected area. It is surprising how many infections can be traced back to native-owned horses: the farmer either neglects to have them properly separated from his own or he may even put his mares to such entires.

The part played by the speculator in the spread of dourine must not be lost sight of. As a result of the measures adopted by the Department, speculators have purchased horses in this area at a price slightly higher than that which would have been paid as compensation and have disposed of them in various parts of the Union. The disease

has been diagnosed later among several of the remaining troops of horses on some farms from which horses had been taken.

Though meteorological conditions—droughts, particularly during the months of September and November—may be a controlling factor of the disease either by delaying the breeding season or eliminating a number of affected animals, yet several reactors may survive to form the nucleus of a new infection. During the drought in 1933, of 12 reactors on the farm Leeuwheuvel only 3 were found alive on the day the animals had to be destroyed and these were apparently healthy. Typical clinical symptoms developed prior to death in several of the animals that succumbed. Similar observations have been made on other farms. Probably, as Andrews has previously pointed out, unmasking of latent cases by unfavourable conditions such as drought is of an importance parallel with that attached by Canadian authors to excessive work and other adverse conditions in producing the same result.

Epizootology.

Dourine is usually transmitted either by an infected stallion to a number of mares or is spread radially from a diseased mare, acting as a focus, through the agency of an entire. Donkey jacks constitute a grave danger, because they may harbour the disease for a considerable time without any perceptible symptoms. It is of interest to note that not all mares that are covered by a given infected stallion contract the disease. Accurate information as to how many mares have been infected by a single stallion is not available, but the American authors Mohler and Schoenig state that about 66% of the mares exposed to an infection may contract the disease. Probably this is sometimes because some mares are not susceptible to the disease, but more often because the trypanosomes being absent at intervals, the stallion is not constantly infective. Occasionally a healthy stallion may transmit dourine from an infected mare to a healthy one without contracting it himself. A number of affected animals are "latent carriers": showing no visible symptoms, they are nevertheless, according to Mohler and Schoenig, able to infect others to which they are bred. Where a number of horses are kept on a farm, the mares constituting a troop of a particular stallion will sicken first or in greater numbers. This would explain the "group infections" which are so upsetting to some farmers. The evidence that the mares do run in troops was confirmed on farms on which the mares were put through a crush. It was noted that mares often entered the crush in more or less the same rotation as on the day they were branded.

Susceptibility.

All sexually active equines are liable to contract the infection. Horses and donkeys appear to be more susceptible than mules. Adult mules not being used for breeding of course rarely become infected

(Keppel). A few blood samples were taken from shot zebras, but the serum proved to be unsatisfactory for the test. Under natural conditions dourine is contracted chiefly by means of an infective coitus, therefore without the help of an intermediary host. A transmission of the disease through the agency of biting and bloodsucking insects cannot, however, be totally excluded, but is apparently of no practical importance since very few parasites circulate in the systemic bloodstream of naturally infected animals (Knuth). Our field experience seems to corroborate this statement as the disease has been successfully stamped out by applying the complement fixation test and adopting measures to prevent further breeding on farms where horseflies (*Tabanidae*) were numerous.

Although it is recorded in the literature that foals of infected mares may contract dourine, the farmers in my area were not inclined to admit the possibility of this suggestion. By submitting to the test all available suckling foals of infected mares, the following facts were revealed: 1) The percentage of reacting foals is higher in the case of clinically affected than in apparently healthy mares (reactors only). In exceptional cases foals of temporarily non-reacting mares gave a positive test. 2) Suckling foals, although reactors to the test, show no perceptible symptoms and may in some instances be regarded as latent carriers of the disease, if the period over which antibodies may be demonstrated in their serum is taken into consideration. But to what extent such animals are involved in transmitting the disease to other susceptible equines was not determined. Antibodies can definitely be demonstrated by means of the test in the serum of foals 1 to 3 months old. A positively-reacting foal may become a non-reactor after a few months. 3) Dourine may be transmitted to the foal through the alimentary tract by means of the milk or the soiled udder of its infected dam. The tender, lacerated mucous membrane of the buccal cavity during the time of teething from the eighth day to the ninth month probably forms the most important port of entry for the trypanosemes. An infection *in utero* or through the intact conjunctiva appears to be of no practical importance. 4) Under field conditions fillies may contract the disease through an infective coitus probably at the age of 15 months to 2 years, and colts when 1 to 2 years old.

Incubation Period.

The time elapsing from the infective coitus to the first outbreak of the disease, according to continental textbooks, varies from 5 or 6 days to a month and even up to 18 months, particularly in cases that take a mild course. The Canadian workers state the period to be from 8 days to 2 months. Owing to our horse-breeding methods, no definite observations have been made for our local conditions and only very rough estimates are at our disposal, being periods of time between the last negative test and the first positive one. It was found that non-reacting mares may

become reactors and even clinically affected within a period of from 3 to 9 months. Probably where a longer incubative period is recorded the initial symptoms have passed unnoticed, a "latent case" may have been dealt with in which the disease was set up by predisposing causes such as excessive work and excitement, or some irregularity occurred on the farm.

Symptoms.

Except in typical cases of dourine, great difficulty may be experienced in diagnosing the disease from the clinical symptoms alone. Suspicion is aroused when several mares become weak in the hind-quarters, lose condition and go down, although still feeding well and provided with adequate grazing.

Two definite stages may be noted in the course of a typical case of dourine; one in which the genital organs are mainly affected and in the other the locomotory apparatus. The former appears first and shows itself as a discharge from the vagina which so wets the tail, buttocks and hocks that immediate attention is drawn to it. If the mare be frightened or forced to move off suddenly, a copious amount of fluid is ejected

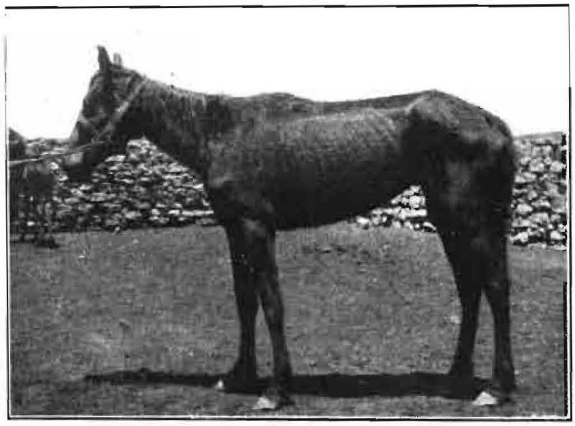

Fig. 1.—A mare showing typical symptoms of dourine.

from the vagina with each step that the animal takes. The tail is held farther away from the body than usual while the mare is in action. On closer examination the vulva is found to be swollen, its lips are gaping, the clitoris is quite prominent and a greyish to yellowish-brown secretion soils the edges of the organ. In a few cases greyish-white spots are seen where the skin of the vulva and perineum has lost its dark pigment, but as such spots may also result from previous tick bites in these regions, their presence may give rise to deception (Theiler). Only 24 mares were seen with the typical discharge from the vagina.

In no case were the typical symptoms described in the textbooks seen in stallions, although the latter were reactors to the test. Of the nine animals found to be reactors only one had facial paralysis and only one other paralysis of the recurrent nerve. The remaining animals were unthrifty and had rough hairy coats. All improved in condition after they had been castrated. Herein our experience tallies with that of Lyons, and that of the Canadian workers. Theiler mentions that the swelling of the sheath was the only symptom seen in a stallion, but was doubtful whether it was connected with the dourine. Maag, although he noticed something wrong in all the entires he castrated, found only two animals definitely affected. The initial symptoms in stallions may be so slight as to pass unnoticed. This is especially true of animals running on the open range and not seen by the owner for long periods.

The second stage may follow the first one immediately or only some time later; there may even be an improvement between the two. According to textbooks, four to six weeks after the infection an urticaria-like exanthema, in the form of raised patches of the size of half-a-crown to a crown, and even larger, appear on the croup, neck, sternum, and lower portion of the abdomen. The shape of the patches is usually round or elliptical. After two to three days a depression occurs in the centre of these swellings forming "plaques." Although they are considered to be pathognomic, these structures were never seen by the writer. Their presence, however, is not constant and in the Canadian outbreak they were comparatively rare. Maag noticed these swellings on several occasions among affected horses in South West Africa.

Two different sets of nervous symptoms are said to occur, first hyperaesthesia, followed by hypoaesthesia and paralysis of certain nerves (Nn. *ischiadicus, tibialis, peroneus, cruralis, obturatorius, facialis, oculomotorius, recurrens*). The former condition could not be traced in this investigation, the animals being usually too wild to be handled satisfactorily.

The paresis in the hindquarters manifests itself by a straddling and swaying gait, difficulty in rising and in lying down, lameness in one or both hindlimbs, knuckling over, and stumbling. The animal moves about with great difficulty, drooping down in the croup, partially drags the feet along the ground wearing the toe more than usual, and may even drop down on being chased. The stride is shortened and in the more advanced cases the thigh is abducted as it comes to bear the weight of the body. When only one leg is affected the animal while resting supports the body on the normal leg and the affected limb is held outwards and usually flexed at the fetlock joint.

In cases where one facial nerve is affected one ear may be drooping, the upper and lower lip hang down towards the diseased side and are

drawn up on the normal one. The opening of the nostril on the affected side is narrowed and lengthened. The *ala* is drawn in during inspiration and acts as an impediment to respiration. Of the 10 animals seen showing such symptoms two were affected on the right and six on the left side. In the remaining two animals the lower lip was markedly drooping. Occasionally roarers (paralysis of the recurrent nerve) are found on farms on which dourine is known to occur. In some animals the affection may be so marked that on the slightest exertion the horse nearly suffocates. Usually the affected horse is in the pink of condition. Seven such cases were seen.

Fig. 2.—Advanced cachexia in a filly suffering from dourine.

The affected animal becomes greatly emaciated and anaemic during the paralytic stage of the disease, although the appetite remains good almost to the end. Later as a result of the progressing weakness it is unable to rise, even though the body may still be supported by the front limbs. Eventually it has to be destroyed as an alternative to death from debility and starvation.

These symptoms may become less pronounced and the animal may improve in condition. In such cases it may even be necessary to lunge the mare in order to detect symptoms . Under such conditions the animal tires soon and shows progressively marked lameness, and a small amount of opaque fluid may be ejected from the vagina. Others lose all perceptible symptoms and seem to have recovered from the disease, but may remain reactors to the test for a considerable time after apparent recovery has taken place.

A typical Case.

In a number of animals only catarrhal changes occur in the upper respiratory tract; a muco-purulent discharge comes from the nostrils. The conjunctiva may also be affected and occasionally the cornea of

one eye is opaque. This form is very often mistaken for *nuwe siekte* (strangles) by the farmer. According to Schilling conjunctivitis and keratitis are frequently noticed during the later stages of the disease.

Some reactors are merely very unthrifty. The hairy coat is staring and dry, and may take a considerable time in shedding at the change of the seasons from winter to summer. In others, in addition, the muscles especially of the back and hindquarters are distinctly atrophied, the ribs are very prominent, and the belly is tucked up. Farmers alluding to such a case say "*die perd het opgedroog*" (the horse has dried up).

Cases have been noticed in which the maxillary sinuses are markedly distended, giving the face a distinctly swollen appearance. A muco-purulent discharge comes from the nostrils and abscesses may break out to the exterior. In a few mares a purulent condition of the udder was present. Whether these changes are merely secondary cannot be definitely stated at present.

A fair number of horses, especially on farms where the disease has existed for a number of years, are apparently healthy (latent cases). They are in the pink of condition and have a sleek hairy coat. These animals are a grave danger to the farmer, because they may be carriers of the disease. Although they seem to be sound and healthy, dourine may be set up by unfavourable conditions such as winter grazing or drought. This was obviously the case on the farm Glen, Boshof District. At the end of February 1932 the horses on this farm, which had been under quarantine for a considerable time, were examined by Veterinary Officer Buck and the writer and no perceptible symptoms were noted; all the animals were in excellent condition and apparently free from the disease. Blood samples were taken from all the animals and the serum was submitted to the complement fixation test at Onderstepoort. As a number of these sera were found to be positive, it was decided that the animals should be re-tested at a later date. This was not possible until September of the same year, when a marked change had taken place. A number of mares were suspected to be diseased and on the test being applied, 33 animals, a number co-inciding with the former test, out of a troop of 148 horses, were reactors. This tallies with the observations made by some farmers who believe that such animals when given a change of food, e.g., put on lucerne, may pick up for a time, but that the improvement is only temporary.

Mares which are impregnated by an infected stallion often show symptoms of the disease and, according to Marek, and Knuth and du Toit, frequently abort during the second and third month of pregnancy. Like Maag, however, I found a large number of the destroyed mares to be in all stages of pregnancy, and even in the far advanced cases no macroscopic pathological changes were seen in the uterus and foetal membranes. Diseased mares may run the full time and foal normally.

Maag mentions an interesting case of a diseased mare which had thrown three normal foals during a period of 4 years. Even reacting, but apparently healthy, mares may become impregnated and foal normally. Abortion and the low fertility in diseased animals mentioned by other authors appear to be comparatively rare occurrences under our field conditions.

Nusshag states that pregnant mares may occasionally react to the C.F. test although not infected, and as a number of farmers had expressed their suspicion as to the validity of the test on this account, it was decided to settle the question. Records were kept of mares that proved to be non-reactors before and after foaling. Fortunately the tests could be carried out on the De Beers farms during the breeding season, whereby a large amount of material was placed at our disposal, which proved to be of great value for this purpose. Samples were taken of 197 mares which had not been in contact with an infection, whereas a record had been kept of 366 mares, which had foaled normally and had given at least two consecutive clean tests. Of these the serum of two on testing was found to give a suspicious reaction, but a negative one on a subsequent test a few months later.

It may be assumed that under our field conditions pregnant mares very exceptionally give a suspicious reaction although not affected, but probably these cases may be eliminated in the future when a clear distinction may be drawn between a doubtful reaction caused by non-specific bodies and that by the specific antibody.

The observations made by Lyons and subsequently by Andrews on his trip to the Kaapse Berg, as well as those made at Onderstepoort by the latter and by Walker on horses sent there for this purpose, tally with those given above. The symptoms enumerated are suggestive of rather an atypical form of dourine, showing much resemblance to the modified form of the disease in Canada.

Pathological Anatomy.

This aspect was somewhat neglected as usually all reacting mares and fillies were destroyed by the Police and thus valuable material was lost sight of. The autopsies made on a limited number of mares did not reveal any lesions that are typical of the disease. Cachectic and anaemic changes were the usual findings in horses that had died or had finally to be killed. Occasionally icterus was present, also slight hydrothorax, hydropericardium, and ascites. The conjunctiva in the early stages may appear quite normal, but in cases of long standing it becomes extremely pale. In acute cases lesions of vaginitis, metritis, and cystitis are noted. The mucous membrane of the uterus may be thickened, has a patchy appearance owing to the presence of hyperaemic areas, and is either

infiltrated with a clear yellowish fluid or may show a number of cysts which contain a similar fluid. In the latter case it is smooth and glistening and discoloured to a greyish shade. In the majority of cases the ovaries are markedly enlarged and show cystic degeneration. Several of the cysts had a diameter of from 2.5 to 3 cm. The perineural connective tissue of the larger nerve trunks is infiltrated with an oedematous fluid.

Histological Changes.

Portions of nerves, uterus, and ovaries were forwarded to Onderstepoort for histological examination. According to the report received, changes of chronic neuritis, deep chronic metritis, and cystic ovaries were seen. Formerly Walker had examined the nerve (sciatic) changes microscopically and concluded that they must be interpreted as those of a neuritis which was pronounced in some cases. He describes a marked cellular infiltration, an increase of the nuclei of the endoneurium, and atrophy of some nerve fibres. The epineurium showed a round cell infiltration, in some places well marked. Contrary to Marek, he found degenerative changes in the muscular tissue.

Mortality from Dourine.

Undoubtedly the severity of the disease varies in different countries and at different times. In South Africa after the summer rains have fallen and the veld has become more luxuriant, a marked improvement may be noticed in the animals, which seem to become quite healthy, whereas during the winter months and droughts they visibly lose condition and a number of animals may succumb to the disease. As previously mentioned only 3 of the 12 reactors on the farm Leeuwheuvel remained alive within a period of 3 months. Theiler is of the opinion that about 50% of the horses may die; accurate figures are as yet not obtainable.

Although so far as South Africa is concerned dourine does not seem to alarm the horsebreeder to a great extent, yet severe losses may be sustained especially on farms where the disease has been recently introduced, as the following figures will show: On the farm Middeldam, of 16 animals tested only 3 survived; on Glen 39 were reactors of a total of 153; on Kalkfontein 22 out of 102; Helvetia 14 out of 25; and Pniel 60 out of 280 animals.

Treatment.

None of the clinical cases and reactors have been treated, for the following reasons: 1) There is as yet no infallible cure for the disease, although with the use of modern arsenic compounds promising results have apparently been obtained; 2) the apparent recovery may not be permanent; 3) the low economic value of most animals to be treated. Farmers claim to have cured

diseased mares by dosing them with Cooper's dip, which contains arsenic. Undoubtedly the condition of an animal may improve visibly. The animal, however, may remain a reactor for a considerable period and may act as a potential source of a new outbreak.

Methods of Control.

For this reason in practically all countries dourine is controlled by effective legislation, the principle being to exclude infected animals from breeding. The measures adopted in South Africa, the validity of the test and factors pertaining to it, and the period over which antibodies may be demonstrated in apparently healthy animals will be given in a later article in collaboration with Dr. Robinson.

Acknowledgments.

I desire to record my indebtedness to Dr. Robinson, Head of the Bacteriological Department at Onderstepoort, who carried out the complement fixation tests, to Dr. de Kock, Acting Director of Veterinary Services, and to Major Keppel, Senior Veterinary Officer, for the advice given regarding the carrying out of these observations, to the Stock Inspectors Temple, Briedenhann, and Liebenberg, who faithfully carried on the bleeding operations during my absence on foot-and-mouth disease work, especially the last named for his assistance in sorting out the necessary data during my recent illness, and to Col. Ormiston, De Beers Farms Office, for his valued assistance.

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GEELDIKKOP.

A Critical Review of the Problem as it affects Sheep Farming in the Karoo together with Recommendations in the Light of Newer Knowledge.

By J. I. QUIN, D.V.Sc., and C. RIMINGTON, M.A., Ph.D., B.Sc., A.I.C., Onderstepoort.

Sheep Farming in the Karoo.

Today, small stock farming, as was the case half a century or more ago, is still the most important and in many cases the only type of farming practised in the wide-spread Karoo areas of the Union of South Africa. However, the type of animal and the method of farming have greatly changed with the passage of time. Formerly such native breeds as the Afrikander sheep and the Boer goat played the chief rôle. Gradually, however, the Angora goat, Black-head Persian sheep, and especially the Merino woolled sheep have taken their place.

Through the intensive system of paddocking (with the object of combating the jackal menace) and the proper provision of water supplies through bore-holes and wind-mills, farming methods have so changed that the flocks instead of being herded by day and "kraaled" by night, as formerly, are now left to themselves enclosed in well-fenced paddocks provided with a constant water supply.

Farming has thus become much easier and even to a certain degree automatic. The type of animal also has markedly improved, so that the Karoo today carries millions of well-bred Merino sheep, playing an important rôle in the sheep and wool industry of the country.

Seeing that the Karoo, where worm pests and blue tongue are practically unknown, is such a healthy area for small-stock, this may be generally looked upon as an ideal form of sheep farming except for certain difficulties which may arise from time to time, and which may cause heavy losses and even threaten the industry.

The first of these is the problem of repeated droughts and the second "geeldikkop," which is closely related to the effects of drought.

The hardened Karoo-bush veld is normally able to survive on a minimum of rain, if falling regularly and well distributed. Unfortunately, however, this is frequently not the case, the tendency being for local showers to fall on certain farms or even on certain paddocks from time

to time, and frequently to cause damage through wash-aways of the soil and dams in the low-lying areas.

The value of the rainfall is further decreased by the high evaporation rate consequent on dry winds and a scorching sun. The result is that all types of plant-growth except the most hardy Karco bush rapidly wilt as the atmosphere becomes dry, especially during the summer months (November to February).

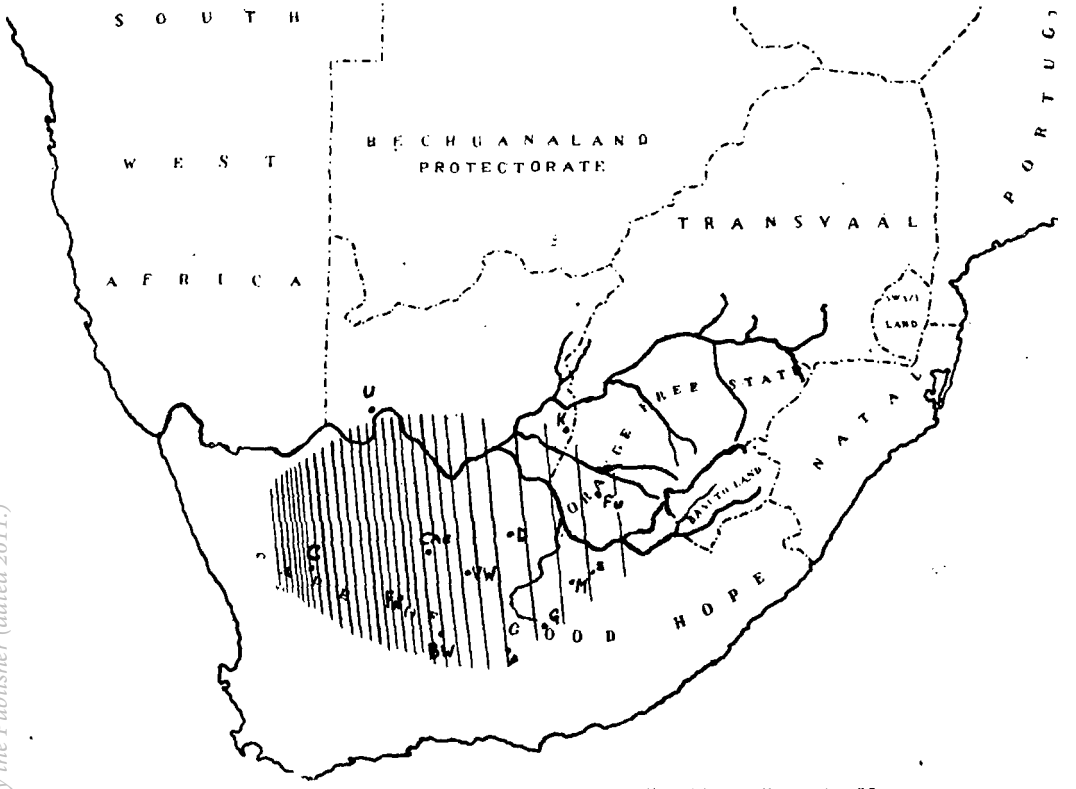

Fig. 3.—Map showing approximate incidence of "geeldikkop" in the Union.

KEY.

A	Aberdeen.	G	Graaff-Reinet
B W	Beaufort West.	K	Kimberley.
C	Calvinia.	M	Middelburg.
Car	Carnarvon.	S	Steynsburg.
D	De Aar.	U	Upington.
Fa	Frazerburg.	V W	Victoria West.
Fu	Fauresmith.		

Parallel shading indicates severity of geeldikkop.

The Karoo veld consists of the various types of Karoo bush and a secondary ("opslag") plant growth, amongst which the few grass species and especially the well-known and wide-spread "dubbeltjie" (*Tribulus* sp.) can be included. It is especially these "opslag" plants (e.g. the "dubbeltjie" the seed of which germinates with the first rain) that provide

the stock with an early green succulent, even to such a degree that animals start feeding more or less exclusively on the "dubbeltjie," especially whilst the Karoo-bush remains dormant or is affected by various parasites. Under these conditions the Karoo-bush has little attraction for the stock.

"Dubbeltjie" is most frequently encountered on the fertile alluvial soil of the flats. The seed is widely distributed by flood water, and germinates with the first moisture. If further rains should fall within short intervals, the plants develop rapidly and the prostrate stems, reaching six feet or more in length, become densely covered with leaves, flowers, and the peculiar sharp "dubbeltjie" or thorny seed. The well grown-out plant is recognised by every Karoo farmer as an excellent stock feed and tests have confirmed the fact that it possesses a high nutritive value. The plant may, however, at times become parasitised by the larva of a small insect resembling the common mealie-weevil. This small larva infests the stems of the plant causing local thickenings. At a certain stage it leaves the plant and develops into the adult insect.

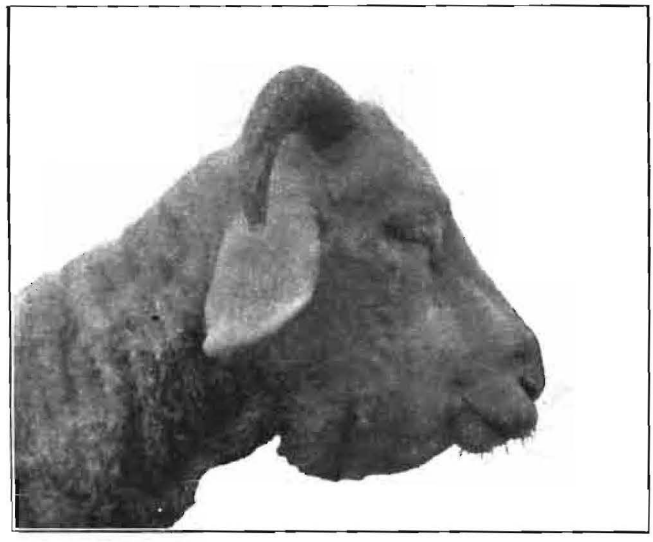

FIG. 4.

Sheep suffering from "geeldikkop" in the acute stage—note swelling of face, ears and intermandibular space.

In the presence of the parasite, and particularly as a result of short intervals of drought, the small "dubbeltjie" plant wilts, sometimes even before it attains a height of one inch above the ground. In this state it is of a dirty brown colour, shrivelled up, and in no way to be compared with the fully developed healthy plant. However, sheep show an avidity for the plant even in this stage, and they frequently uproot it

whilst grazing. It is at this moment that "geeldikkop" frequently makes its appearance and causes such havoc amongst Karoo flocks.

The Geeldikkop Problem.

"Geeldikkop" is without doubt one of the oldest and best known small stock diseases of the Karoo, and even today is still responsible for heavy annual losses, which are determined not only by the peculiarities of climate and rainfall in the Karoo, but also by the changed methods of farming. The causes for the continuation and even the apparent increase of the disease are fairly clear. In the first place, the finely bred merino sheep and Angora goat with their soft white skins, are more susceptible to the disease than the hardy Afrikander sheep and Boer goat, which formerly formed the flocks.

Further, through the present system of paddocking, flocks are confined to certain prescribed veld areas, while formerly the tendency was to allow them to roam in search of the best grazing, although under constant supervision of the shepherd. Under present conditions, outbreaks of dikkop may, however, remain undetected for several days, thus resulting in appreciable losses. Another result of the old system of farming was overstocking and trampling out of the veld, erosion of the soil, and a general tendency towards degeneration of the most valuable species of Karoo-bush, while "opslag" vegetation increased (e.g. "dubbeltjies" and undesirable grass species which germinate annually from seed). It is this type of "opslag" which is responsible for the greatest losses, for example from "geeldikkop," "geilsiekte," and "steekgras" troubles.

Although overstocking is today recognised as the greatest evil of sheep farming in the Karoo, it is still frequently practised, seeing that the carrying capacity of the veld changes so rapidly and so frequently with the season, incidence of drought, etc. The almost entire absence of trees from the Karoo is another factor of great importance to stock farming. As a result of the great scarcity of fuel and the destruction by animals, most of the indigenous trees have completely disappeared. All the abovementioned factors have contributed in a direct or indirect way to aggravate the "geeldikkop" problem on the Karoo.

The Origin and Course of the Disease.

"Geeldikkop" is especially a disease of lambs under twelve months old, usually appearing only on certain farms or in certain paddocks during the months December to March, depending upon the rainfall. However, in some seasons the disease may be wide-spread and affect animals of all ages.

The disease is definitely caused by excessive feeding on wilted "dubbeltjie" plants, which primarily lead to constipation in the large

intestine and a stoppage or disturbance of movements in the rumen. At the same time the liver and gall-bladder are affected; there is a progressive accumulathion of bile, which rapidly passes into the blood-stream, and which to a certain degree may be eliminated in the urine.

It has been proved that the blood serum of many sheep may in this way turn yellow before any external symptoms of "geeldikkop" can be detected. Some of these animals subsequently develop a strong sensitivity to sunlight, whereas amongst the rest the disease never progresses further than a slight jaundice in the blood serum.

This sensitivity to sunlight, so characteristic of the disease, is caused by a colouring matter, phylloerythrin, contained in the blood-stream and formed from chlorophyll which is present

FIG. 5.

Various stages of " geeldikkop " disease; **left,** chronic case with hardening of facial skin; **right,** acute cases with oedema of head.

in all green plants. Sensitivity is localised to the unprotected parts of the skin, e.g. the head and ears, and in mild cases results only in a superficial sloughing of the skin, closely resembling ordinary sunburn in man. In most cases, however, the symptoms are much more severe, the face and ears swelling tremendously, while the coronet of the hoof and the base of the horns assume a dark purple-red colour. Such animals appear very sick, running a high temperature and showing a certain measure of shock. They continually seek shade, and may easily be detected amongst a " kraaled " flock, where they can usually be found hiding themselves in corners and along the walls of the kraal. On further exposure to sunlight, the symptoms rapidly become aggravated, the animals appear half stunned and loth to move. The affected skin turns hard and dark brown. In many cases there is blindness and rupture of the eyeballs. Such animals cease feeding and drinking

on account of the jaws becoming rigid through injury to the skin. The mucous membrane of the eyes and mouth assumes a deep yellow colour due to the extensive jaundice. The animals rapidly lose weight and present a pitiable spectacle; many ultimately die from starvation and thirst.

It is especially the after-effects of the disease and not the disease itself from which so many animals may succumb. Sheep which eventually recover may show a long period of convalescence. In this way large flocks frequently suffer a severe setback in condition accompanied by damage to the wool.

FIG. 6.

Chronic cases of "geeldikkop." Skin of face is hard, leathery, cracked and necrosed. Note that the ears of the lamb on the right have sloughed off and that the lips are stiff and retracted, thus exposing the teeth.

The Practical Handling of the Geeldikkop Problem.

In order to combat the "geeldikkop" problem in a practical manner and with any measure of success, it is essential that the following facts be clearly noted :—

1. The disease is closely related to the difficult problem of periodic droughts in the Karoo, the peculiarities of climatic conditions, and the patchiness of the rainfall.

2. Sheep farming in the Karoo is necessarily conducted on an extensive scale resembling ranching conditions. The flocks are distributed in camps, frequently hundreds of morgen in extent; consequently there is no daily supervision of all the animals, which can only be rounded up with difficulty and then only in cool weather.

   Should a disease break out, for example "geeldikkop," it becomes exceedingly difficult, if not impossible, to detect and

remove sick animals in the early stages of the malady. Treatment is thereby rendered more difficult, in view of the fact that sick animals, through weakness and blindness, tend to become detached and lost from the main flock.

3. "Geeldikkop" is caused through the eating of the "dubbeltjie," a plant which normally forms an excellent sheep feed, but which under the influence of drought and a burning sun rapidly wilts and may become poisonous. The plant is as widely distributed as the Karoo-bush itself and consequently should be looked upon as a typical inhabitant of the veld with a strong tendency even to spread from year to year. It is ravenously eaten, even in the wilted and half-dried state.

4. The disease may affect large numbers of animals without, however, all of them showing definite symptoms. The first symptom is a severe sensitivity towards the penetrating sunlight which then leads to acute swellings of the unprotected, white skin.

5. There are exceptionally few trees on the Karoo veld so that shade is only obtained with difficulty if at all.

6. Stock is frequently forced to graze on "dubbeltjie" veld because other types of vegetation are scarce or absent.

From the above facts it becomes clear that "geeldikkop" constitutes an exceedingly difficult problem and that a complete solution is out of the question until such time as the major problem of drought has been successfully dealt with, or that sufficient supplementary feeding has been provided to take the place of the poisonous "dubbeltjie." Further it is clear that no remedy given by the mouth, even if a highly specific one were known, would save flocks, seeing that such insuperable difficulties stand in the way of regular and early dosing and on account of the necessity for repeated dosing as long as the "dubbeltjie" remains poisonous. The symptoms appear so rapidly amongst animals widely spread over the veld that no remedy could be administered in time. This condition of "geeldikkop" is not to be compared with an infectious disease such as bluetongue, which can be effectively controlled by the timely injection of a vaccine which produces a solid immunity. Therefore it must be accepted that "geeldikkop" will continue as a disease for many years to come. The object of the stock farmer should be to safeguard his flocks against the disease and to minimise his losses as far as possible. It is the flock as a whole and not the individual which, in the first place, merits protection.

If the following suggestions are carefully carried out it becomes a practical possibility to rob the disease of its devastating effect.

General Preventive Measures.

The nature of the veld in the various camps on a farm should be carefully studied. "Dubbeltjies" are especially plentiful and frequently poisonous on the alluvial soil of low-lying flat areas, whereas hilly veld is relatively safe. The nature of the rainfall further serves to indicate whether or not "dikkop" is likely to be severe in any given season. For example, early rain in November to December, followed by a period of drought, is especially dangerous.

Should there be any indication that the summer season will tend to be unfavourable, all flocks should be placed under regular and if possible daily supervision so that the disease may be detected without delay. As soon as the first cases appear (usually amongst lambs) the whole flock is to be shifted to another paddock of the farm or on to hilly veld. Through movements, the grazing habits of the stock are temporarily changed, with the result that the disease rapidly subsides. If necessary, flocks should be moved repeatedly within the same season. Where possible, watering should be allowed in the early morning only. Although it entails a certain amount of extra labour, all flocks should be strictly supervised during the "dikkop" season.

Seeing that sunlight has such a grave effect upon sick animals, being directly responsible for the swellings of the head and injury to the skin, every endeavour should be made to provide more and better shade in each camp.

Every tree on the Karoo should be protected and encouraged. Furthermore it is highly desirable that trees should be planted in every paddock and especially near to the watering places, no matter how difficult it may be to get them properly established. Young trees should be fenced-in and protected from the stock. Requirements are that the trees cast a dense and low shade under which the animals can shelter during the heat of the day. Apart from adequate grazing and watering, shade is without doubt the most important necessity to sheep farming on the Karoo. Good shade affords immediate relief to animals in the early stage of "geeldikkop." Through it, the skin is less damaged, the disease consequently running a much milder course. Sick animals invariably seek shade and will therefore be found congregated in such places where shade is provided.

Apart from the beneficial effect of shade during sickness, it has another important effect, namely on the wool and on the general bodily condition of the animal. On account of its thick skin covering, the merino sheep is admirably protected against intense cold. Under South African climatic conditions, however, and particularly on the Karoo with its dry summer heat and penetrating sunlight, the animal as well as its wool is adversely affected. The exposed parts of the wool fibres

become dried up and bleached, with the result that there is a greater quantity of wastage of the wool in so-called "noil," whereas just the reverse is desirable, viz. a greasiness at the exposed wool tips (greasy tip). The scorching rays of the sun furthermore cause an abnormal heating up of the wool and skin of the animal, with the result that the animal experiences difficulty in maintaining a normal body temperature. These factors exert an exhausting influence on the animals, as can be clearly seen from the drowsiness of a flock of sheep during the heat of the day. Under these conditions it is therefore highly necessary that the animals be provided with the requisite shade. Where there are no dense trees in a paddock, the erection of other forms of shelter is strongly advised. Such can be constructed from a light wooden framework roofed over by corrugated iron, thatch, or hessian in such a manner that it provides good shade cast low on to the ground and sufficient for a large number of animals. Shelters should be placed where there is the least chance of dust forming, otherwise it may be desirable to have the ground covered with gravel or some similar material.

Individual Treatment.

As far as any individual sick animal is concerned the adoption of the abovementioned recommendations will cause the disease to follow a milder course. However, to minimise losses, it is essential to keep sick animals under daily observation. The worst cases should be brought near to the homestead where they can remain undisturbed, grazing on a shortly cropped lucerne paddock provided with shady trees. As soon as a sick animal is detected, it should be placed in the shade. To prevent further swelling and hardening of the skin, a preparation consisting of equal quantities of lime-water and raw linseed oil should be prepared. Lime-water is made up by mixing 1 lb. slaked lime with 2 gallons of water and pouring off the clear liquid when the lime has settled. This liquid is thoroughly shaken with the linseed oil until a creamy consistency is reached. The mixture is then applied daily for a few days to all exposed parts of the head, eyes and ears. As a purgative 2 to 3 tablespoonsful of Epsom's or Glauber's salts dissolved in half a cup of water should be given in the early acute stage.

If these recommendations are carefully followed losses from "geeldikkop" should be negligible. However, during the "geeldikkop" season it is essential that constant attention be given to all flocks grazing on "dubbeltjie" veld.

Finally, it should be realised that the "geeldikkop" season is comparatively short, usually lasting only two to three months, and hence active measures undertaken during this period and involving a temporary departure from the more-or-less automatic method of sheep farming usually practised will be amply repaid.

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THE SHEEP NASAL FLY.

A Method of Treatment for Sheep infected with Larvae of *Oestrus Ovis*.

By R. du TOIT, B.V.Sc., Onderstepoort, and R. CLARK, B.V.Sc., Ermelo.

During the past few years and especially during the winter months of 1934 numerous enquiries have been received at Onderstepoort for methods of combating nasal bots in sheep. The farming community as a whole is beginning to take a very serious view of the problem and, although comparatively few deaths have been attributed to the larval infection directly, the economic loss attributable to the irritating and debilitating effects of the grubs is very considerable. So ubiquitous is the parasite and so common a finding at almost all post-mortem examinations that the departmental view in the past has rather been one of tolerance to such complaints and no very serious effort has been made towards a solution of the problem.

Today it is realized, however, that the problem is increasing from year to year on account of the entire immunity from destruction that this parasite has enjoyed and that gradually it is becoming a menacing factor in the sheep farming industry in certain parts of South Africa, notably the Transvaal Highveld, the south-eastern Orange Free State and the north-eastern Cape districts.

With the object of finding some method of successfully combating the parasite, one of us (R. du T.) commenced studying its life history during 1933, the object being principally to determine the laying season of the adult fly. It was soon found that larvae of all sizes occurred in the nasal passages and sinuses throughout the year, which indicated that the use of repellants applied to sheep during certain portions of the year only could not be of much value. It was further observed that only very rarely were larvae encountered in any but the posterior portion of the frontal sinus and a method of treatment then suggested itself which is stated by Stewart[1] and by Lowe[2] to have given excellent results in Australia and Tanganyika respectively.

In order to test out a suitable drug which would have a rapidly lethal effect upon the larvae, a large number of *in vitro* tests, wherein many different drugs were employed, were made upon larvae in all phases of growth. Carbon bisulphide was found to kill the larvae almost

immediately, one minute sufficing for certain death when brought into direct contact with them. A mixture of equal parts of carbon bisulphide and a light oil was found to give practically the same effect. At a later stage ethylene tetrachloride was tried and the lethal effect was found to be fully equal to that of carbon bisulphide.

Description of the Instrument.

It was realized that if the treatment was to be applied generally by inexperienced hands a safer method of administering the drug would have to be employed than that advocated by Stewart and with that object in view the following instrument was devised. (Fig. 7.) The

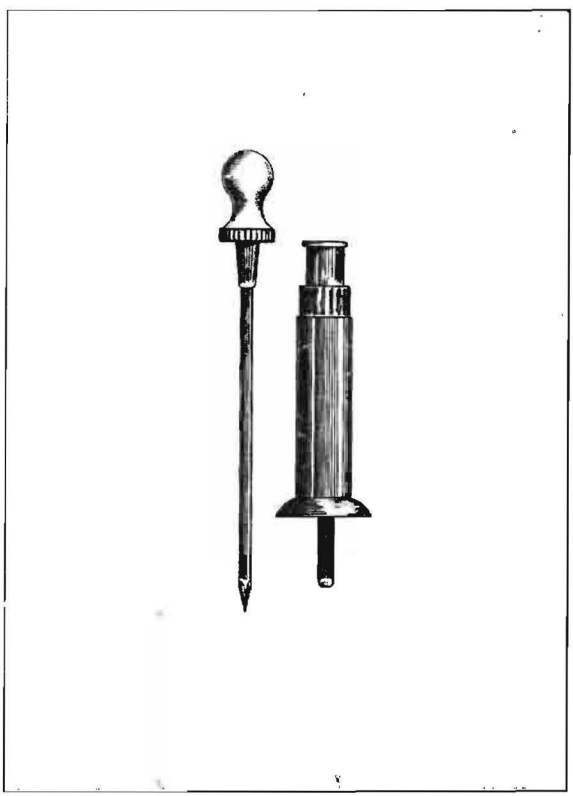

Fig. 7.

Trocar and canula as used for injection into the frontal sinuses of sheep. Natural size.

instrument consists of a small canula, roughly 1½ inches long, which is sweated to a stout metal rod having a dilated base, in such a manner that the canula projects 5/16th inch beyond the base. This dilated base ensures adequate protection against the needle being driven in too deeply and at the same time permits of the canula penetrating the

mucous membrane lining the sinus. A rigid steel trocar, having a solid brass head, fits into the canula and projects $\frac{1}{8}$ inch beyond it. The distance between the guard and the tip of the trocar is therefore 7/16th inch, which was found to be ample to penetrate the skin, bone and underlying mucous membrane and at the same time affords a good margin of safety. The head of the canula fits the nozzle of an ordinary Record syringe used for dosage of the mixture.

The treatment consists of an injection into each frontal sinus of 2 cc. of a mixture of equal parts of carbon bisulphide and liquid paraffin.

Sites of Injection.

A. In rams, wethers, and ewes showing a fair development of horn, the injections are best made one-quarter of an inch orally to the middle of the bases of the horns, as indicated in Fig. 8; one injection on each side of the head. Ewes which show horn-buds approximately half-an-

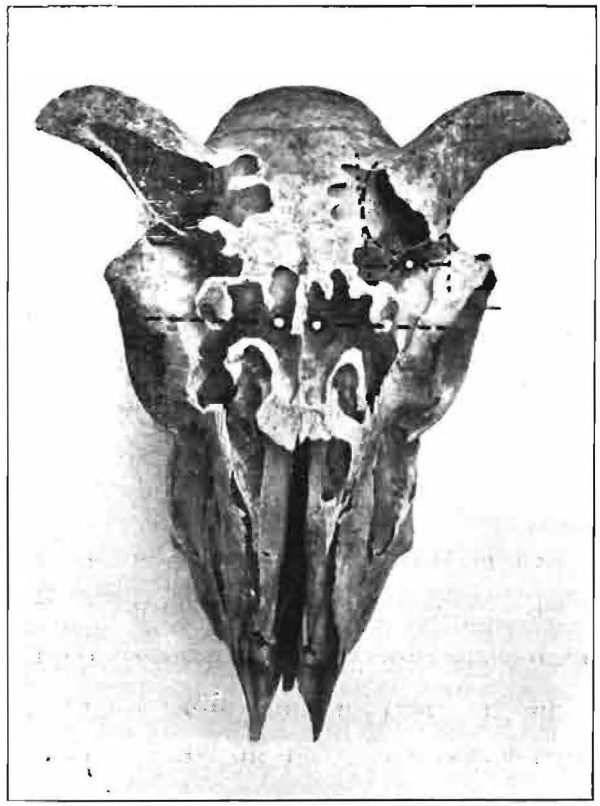

Fig. 8.

Skull of an adult horned merino sheep with the frontal sinuses exposed, and sites of injection indicated.

inch in length will have an ample development of the frontal sinus under the hornbud and are also best injected at this site.

B. In the case of hornless sheep, the injections are made one-quarter of an inch from the mesial plane of the head on each side, on a transverse line extending between points one-quarter of an inch above the centres of the bony orbits of the eyes. If the orbits of the living animal are palpated with the fingers a notch in the bony rim on either side can be felt. Points situated a quarter of an inch above these notches on either side will indicate the two ends of the transverse line, as shown in Fig. 7.

Mode of Injection.

The guarded trocar and canula is held in the left hand with the point pressing on the skin at the site of injection and by means of one sharp blow with a wooden mallet driven in up to the guard flange. It is desirable that one blow only should suffice to drive the instrument home or otherwise there is a danger that the point of the trocar will carry the mucous membrane lining the sinus with it instead of penetrating it. In the case of hornless sheep it is necessary that the wool between the eyes be clipped away as the injection cannot be made satisfactorily in the presence of long wool.

It is realized that this method will give relief only to sheep which actually harbour the parasites and will in no way protect sheep against subsequent attack by the fly. However, the life history of the parasite occupies a considerable period and the relief afforded if the infection is completely or even partially destroyed is of fair duration. Furthermore, an effective remedy for the larval infection, if generally employed, will do a great deal towards minimising the numbers of adult flies during the following year.

Effects of the Injection.

The symptoms displayed by sheep upon completion of the injection are most alarming to those not having had previous experience with this method of treatment. The animal may sneeze violently or appear stunned for a moment after which it struggles violently and generally rears up on the hind legs, in some cases even falling over backwards. Now ensues a period of pronounced intoxication in which the head is held low or over to one side, the gait is unsteady, and the movement of the limbs incoördinated. In some cases the animals appear extremely dull, standing with the neck extended and the head low down. Breathing may be laboured or hurried.

As a rule, one or two minutes suffice for the sheep to recover from the intoxicating effects of the drug and they may appear somewhat dull for 10 to 20 minutes. Within half an hour, as a rule, the symptoms have passed off entirely, and the animals are again prefectly normal.

If the operation is correctly performed no dangerous after effects result nor can any inflammation be observed in the mucous membrane of the sinus apart from a slight increase in the excretion of serous fluid in some cases.

Fate of the Larvae.

Mitchell and Cobbett[3] have shown that in Texas, deaths attributable to *Oestrus ovis* infection are always associated with the presence of dead larvae in the sinuses and for this reason they question the advisability of destroying the larvae in this situation. We have found on the other hand, that in routine post mortem examinations of sheep at Onderstepoort, where the cause of death can definitely be established as something apart from *Oestrus ovis* infection, dead and often partially decomposed larvae are a fairly common finding even in the case of normal slaughtered sheep.

No detailed study of the fate of the larvae following upon the treatment has yet been made, but where animals have been examined at autopsy shortly after treatment, dead larvae have frequently been encountered, whereas after the lapse of a day or two larvae are only rarely found, which seems to indicate that the sheep is capable of voiding the dead larvae either by forceful sneezing or through the agency of the ciliary mechanism of the epithelium which lines the sinuses.

This method of treatment is still in the experimental stage. Apart from the lack of sufficient experimental data, various drugs still remain to be tested, e.g. tetrachlor-ethylene has been proved by *in vitro* tests to be just as effective as carbon bisulphide and at the same time, by injection in living sheep, to be very much milder in so far as its effects on the sheep are concerned. Suitably infected experimental animals are, however, lacking at Onderstepoort and it has been found almost impossible to conduct properly controlled experimental work on account of this lack of suitable material. One of us (R.C.) has undertaken to test this method of treatment amongst badly infected flocks in the field, but we have been greatly handicapped by the inaccessibility of suitable material and the transport expenses involved in keeping the treated flocks under proper observation.*

The somewhat meagre observations so far obtained have led us to believe that much might be expected from this method of treatment; but the help of veterinarians in other parts of South Africa, who have the opportunity of coming into contact with suitably infected flocks, is solicited in order to place the method of treatment outlined above upon a sound scientific basis.

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* A short account of some of the field experiences obtained by the application of this method of treatment in the Ermelo district appears hereafter in the form of an appendix in order to indicate both the results obtained and the reception this treatment generally receives from the average farmer.

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APPENDIX.

Field Experience with the Treatment.

During September and October, 1933, I received such numerous and urgent enquiries for some form of treatment for *Oestrus ovis* infection that I was forced to reconsider my attitude towards the disease. Subsequent field observations convinced me that under certain conditions this parasite *per se* can be responsible for severe losses.

In July, 1934, I was again inundated with enquiries as a result of which the treatment with carbon bisulphide, outlined in the foregoing article, was applied. The treatment aroused a great deal of interest amongst the farmers of the Ermelo district, especially as at this time the sheep of the eastern Transvaal were in very poor condition due to the wet summer of 1933-34 having been followed by a wet winter which had resulted in extensive verminosis.

In all cases where treatment was carried out, a post mortem (or in some cases numerous post mortem) examinations were performed in order to arrive at an accurate diagnosis of the cause of the losses. In some cases *Oesophagostomum columbianum* was found to be responsible, but in many cases the only parasite present in sufficient numbers to be looked upon as the factor responsible was *Oestrus ovis*. As was to be expected, sheep heavily infected with *O. columbianum* did not respond to treatment with carbon bisulphide. In all cases, however, where *Oestrus ovis* was found on post mortem to be the principal parasite affecting the sheep, marked and rapid improvement followed the injections. This fact is, in my opinion, proof of the pathogenicity of the parasite.

In my experience sheep must be heavily parasitised by *Oestrus ovis* before any symptoms indicative of the infection become readily apparent. Sheep so affected stand with the heads hanging and blood-stained mucous exudes from the nostrils. In bad cases sheep cease grazing and even refuse maize when this is offered. Up to 84 larvae have been collected from a single lamb which showed extensive inflammation and necrosis of the mucous membrane lining the sinuses. There seems to be little doubt, therefore, that when infections attain such a degree of severity, losses can be encountered attributable solely to this parasite.

The treatment has proved acceptable to farmers and numerous demonstrations have been held at the request of Farmers' Associations, all of which have been well attended. Many farmers have invested in their own trocars and carried out the treatment successfully. Up to 50 sheep per hour have been treated by the writer and no deaths have occurred in sheep personally treated, but a few farmers have reported deaths amongst sheep which they have injected. In the light of this experience it seems advisable, therefore, that personal tuition from the veterinarian concerned is highly desirable before this treatment is advocated to stock farmers. Post mortem examinations should be carried out before remedial measures are applied in order to establish the presence of the parasite, or otherwise the treatment may be condemned unfairly.

It was impossible, unfortunately, to carry out properly controlled experiments during the latter part of 1934. At the time the treatment was carried out conditions in general were improving and the sheep throughout the district were picking up. The following few examples may prove of interest in showing, to some extent, the results so far obtained :

No. 1. This flock had consisted of some 800 sheep . Very heavy losses had occurred and on 6.8.1934 the main flock was moved to lower veld in an attempt to arrest the deaths; 28 of the sheep were kept back as these were too poor to trek. On 8.8.1934 (i.e. 2 days later) I arrived on the farm and only 14 of the 28 were alive.

One lamb was sacrificed and examined, showing a very light *O. columbianum* infection and a gross infection with *Oestrus ovis.*

Result of Treatment: On 24.8.1934 all 14 were still alive and improving rapidly. Within one month of treatment all 14 rejoined the bulk of the flock.

After having lost 400 sheep the owner treated 370 and reported that, with the exception of a few losses subsequently, the sheep were now in excellent condition and that he was extremely satisfied.

No. 2. 20 of the poorest sheep in this flock, including one stud ewe *in extremis,* were treated. Obvious symptoms of heavy *Oestrus ovis* infection were noted.

Results: The ewe was treated with the view to a post mortem examination when it died. The ewe withstood the operation and picked up subsequently. It is now in lamb. The other 19 all showed rapid improvement. The owner expressed himself as very satisfied.

No. 3. 108 lambs, 3 to 4 months old, were very badly infected and dying at the rate of 10 a day. Seven lambs died on the day the

treatment was applied and *Oestrus ovis* infection was found to be very heavy. General worm infection present.

Results: Although it was explained to the owner that I had never treated such young sheep and that I expected losses as a result of the treatment, he insisted on my treating the lambs as they would die in any case. The lambs were injected in the usual way and about 50% died during the ensuing two weeks. The others are still very weak.

No. 4. Despite all efforts at dosing and feeding the owner was unable to get his rams into fit condition so as to put them among the ewes in November and December. 40 Rams were treated at the end of November and the owner reports that they responded to feeding immediately.

CONCLUSION.

The treatment is safe, practicable and efficacious when carried out in the proper way and on suitable subjects.

The method described in the foregoing article is not safe for sheep under about 6 months of age.

OBITUARY.

James Frank McIntyre.

Graduated at Glasgow in 1901, and practised in Grenock and Glasgow prior to the Great War. He served three years during the Great War in the R.A.V.C. In 1921 he arrived in South Africa and was appointed Government Veterinary Officer at Umtata. He resigned owing to ill-health and thereafter settled in Durban where he practised privately. He was extremely popular with his clients and all who knew him. He leaves a widow but no children, his only son having been killed in a motor accident in 1926.

He died on the 28th September, 1934, at the age of 60.

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HORSESICKNESS.

Field Experiments with Neurotropic Vaccine during the Season 1933-34.

By R. A. ALEXANDER, B.Sc. (Agric.), B.V.Sc., and
B. VAN DER VYVER, M.R.C.V.S.

The Field Experiments.

At the time these experiments were conducted it had been established that horsesickness virus, after neurotropic fixation and an adequate number of passages through the brains of mice or guinea pigs, becomes attenuated to such a degree that upon injection into susceptible horses and mules little more than a mild febrile reaction is produced (Alexander and du Toit, 1934). In addition it had been shown that every animal which receives a definitely infecting dose of attenuated virus subsequently develops a solid resistance to the intravenous injection of the homologous virulent strain. These findings immediately suggested the basis for a new method of immunizing horses and mules, but since the experimental work had been carried out exclusively on stabled animals at Onderstepoort it was essential to determine, firstly, whether the method would be equally safe when applied to animals running under normal farming conditions and, secondly, whether the immunity produced would be adequate to protect against natural infection. Incidentally it was hoped that by exposing immunized animals in the field under adequate control it might be possible to collect, from possible breakdowns, strains of virus immunologically distinct from those that were being attenuated in the laboratory.

Various farmers, chiefly in the Pretoria district, were approached and when the scheme had been outlined to them they readily agreed to place animals at our disposal for experimental purposes. We wish to take this opportunity of expressing our appreciation of the spirit which prompted the farmers in question to assist us, since without their co-operation it would have been almost impossible to have conducted so comprehensive a field experiment.

The injections carried out and the results obtained are given in tabular form below. It will be noticed that the animals are retained in groups of variable numbers; these groups represent horses injected at the same time on individual farms. The vaccine in every instance consisted of either a 0.1% emulsion of infective mouse brain or a 0.2% emulsion of infective guinea pig brain made up in 10% normal horse serum-saline with 2% ether added as a preservative. The dose given

was 10 cc. subcutaneously, irrespective of size or age, injections being made as soon as possible after preparation of the vaccine, though in some cases an unavoidable delay of as long as 14 days occurred.

No. of horses.	1st Injection. Date.	Virus.	2nd Injection. Date.	Virus.	Remarks.
2	16.10.33	Gp. 37/K	—	—	—
5	16.11.33	Gp. 37/K	20.1.34	M.89/0	—
9	20.11.33	Gp. 37/K	—	—	1 horse died 16.3.34 Horsesickness.
2	21.11.33	Gp. 37/K	12.2.34	M.91/0	—
18	24.11.33	Gp. 38/K	—	—	1 horse died 10.3.34.
4	24.11.33	Gp. 38/K	3.3.34	M.93/0	—
6	9.12.33	Gp. 38/K	—	—	—
4	9.12.33	Gp. 38/K	23.1.34	M.89/0	1 horse died 3.3.34. Dikkop Horsesickness. (1)
2	15.12.33	Gp. 38/K	—	—	—
2	15.12.33	Gp. 38/K	—	—	Both died, 1 on 20.1.34, 1 on 14.3.34.
2	18.12.33	Gp. 38/K	10.2.34	M.89/0	—
3	28.12.33	M.92/K	1.3.34	M.93/0	1 horse showed clinical symptoms of Dikkop Horsesickness on 10.3.34 and recovered. (2)
1	28.12.33	M.92/K	—	—	Died 19.2.34.
12	29.12.33	M.92/K	15.2.34	M.91/0	1 horse died 20.2.23. (3)
3	7. 1 .34	M.92/K	—	—	1 horse died 10.3.34.
5	7. 1 .34	M.96/K	10.3.34	M.93/0	—
18	7. 1 .34	M.96/K	—	—	1 died 20.3.34; 7 died between 10.3.34 and 6.4.34. (4)
20	15.1.34	Gp. 42/K	—	—	—
2	15.1.34	Gp. 42/K	—	—	1 died 12.2.34.
4	18.1.34	Gp. 42/K	—	—	—
3	20.1.34	Gp. 42/K	—	—	1 died 10.3.34; 1 showed symptoms of Horsesickness (dikkop) on 5.3.34, but recovered.
6	23.1.34	Gp. 42/K	—	—	1 died 29.3.34.
9	25.1.34	M.77/464	—	—	5 died between 9—12/3/34. (5)
5	26.1.34	Gp. 38/K	—	—	—
4	31.1.34	Gp. 42/K	—	—	1 died 5.2.34 (6); 1 died 19.2.34; 1 died 14.3.34; 1 recovered from natural attack on 12.3.34.

No. of horses.	1st Injection. Date.	Virus.	2nd Injection. Date.	Virus.	Remarks.
5	1.2.34	Gp. 42/K	—	—	1 died 5.2.34. (6) 1 died 19.3.34.
5	12.1.34	Gp. 42/K+M 77/464	—	—	—
7	26.2.34	ditto	—	—	—
3	29.1.34	ditto	—	—	—

Note. Gp. 37/K means generation 37 of virus strain K in guinea pigs.
M/89/0 means generation 89 of strain O in mice, etc.
The numerals in parenthesis refer to discussion in the text.

In addition to the horses enumerated above, 28 mules were immunized either by a single injection of one strain of virus, or by successive injections of two strains or by a single injection of a mixture of two strains. There was no accident as a result of immunization, and although the mules were running in areas in which numerous cases of horsesickness occurred, the immunity to natural infection appeared to be solid.

Results.

Before the results of this field experiment on 171 horses are surveyed as a whole it is necessary to direct attention to some peculiar features connected with the reactions in, or the death of, the individual animals indicated by the numbers in parenthesis in the table.

1. This horse, immunized successively against strain K and strain O, was running on a farm at Hammans Kraal about 20 miles north of Pretoria. Following a report from the owner it was examined and a clinical diagnosis of dikkop horsesickness was made. The following day it died and the diagnosis was confirmed by subinoculation into a susceptible horse at Onderstepoort. The virus collected on two occasions failed to produce more than a transitory febrile reaction of only 24 hours duration in horses immune to the four strains incorporated in the present quadrivalent vaccine and so has been discarded as being of no further immunological value.

2. The clinical dikkop horsesickness reaction in this horse immunized two months previously against strain K was undoubtedly produced by the O-virus vaccine. In spite of the pronounced supraorbital oedema the prognosis was always favourable and recovery was uninterrupted. This phenomenon of a severe reaction in one particular horse of a group is frequently encountered and is believed to be due to individual idiosyncrasy.

3. Since death occurred as early as the 5th day after injection of the O-virus vaccine it is believed to be due to a breakdown of the anti-K-immunity as a result of natural infection picked up prior to the second injection. This opinion is based upon a fairly extensive experience of

the type of reaction anticipated even in hypersusceptible horses following injection of partially attenuated O-virus after previous immunization against strain K.

4. These horses had been immunized against strain K only. Virus was collected from two animals *in extremis* and by *in vivo* immunity tests was subsequently shown to be of the type O.

5. Unfortunately virus could not be collected from these animals but it is worthy of note that they had been immunized only against virus 464, the antigenic value of which had not been determined accurately. The injections were given simply as an experiment to determine whether this strain had attained an adequate level of attenuation after 77 passages through mice.

6. These two horses which died on the 4th and 5th day respectively after the initial immunizing injection of K-virus vaccine were undoubtedly in the incubation stage of a natural attack of horsesickness when treated. This opinion is expressed because even fully virulent K-virus produces a disease characterized by a long incubation period and rarely proving fatal before the 9th day.

The outstanding feature of the results of the entire experiment is the finding that horsesickness virus after attenuation by adequate cerebral passage through mice or guinea pigs may be injected into susceptible horses and mules with safety. The results of laboratory experiments have therefore been confirmed under field conditions. Only three out of 171 horses (1.8%) died under circumstances which might possibly incriminate the vaccine and it has been shown above that this blame is hardly justifiable. Even so a total mortality of 1.8% as a direct result of immunization would represent a decided advance over previous methods, and when it is pointed out that none of the strains of virus used had been propagated in mice for as many as 100 generations, it will be appreciated that the results become even more encouraging. That the field trial was a severe one is indicated by the fact that the experiment was commenced at a time when the horses were in exceedingly poor condition as a result of poor grazing after a severe winter followed by prolonged drought and that later, during the abnormally wet January of 1934, many of the horses were exposed to as much as seven inches of rain during the period of the febrile reaction. No stabling or artificial shelter was provided and no provision was made for feed to supplement the available grazing. A complete history of every animal in the experiment could not be obtained from the owners, so that no data were collected as to the variations in the severity of the reactions produced. It is believed that every death has been recorded and for the rest the farmers reported that the vaccines produced no visible reaction.

As regards the immunity produced, the figures may at first sight appear somewhat disappointing. Out of a total of 171 horses treated

two or 1.2% subsequently showed clinical horsesickness and recovered, while 27 or 15.2% died. In passing it may be mentioned that every death has been assumed to be due to horsesickness and this may be a source of error. It must be remembered, however, that the majority of animals were immunized against only a single strain of virus in sufficient time for the development of a solid immunity before the onset of the horsesickness season. Only 52 horses or 30.4% were immunized against two strains and in this group only a single death occurred. Further it was shown that at least eight of the horses which died succumbed to natural infection with type O after being immunized only against type K. Unfortunately the types of virus responsible for the remaining deaths could not be determined owing to practical difficulties which prevented the collection of blood. It becomes obvious therefore that had it been possible to use even a bi-valent vaccine, the results would have been far more encouraging. However, when the work was commenced only one strain had been attenuated sufficiently for use. In view of these circumstances, a greater number of breakdowns might well have been recorded and at least the laboratory observation that decrease in virulence of the attenuated virus is not accompanied by loss of antigenic power has been confirmed, since the immunity test during the bad horsesickness season of 1933-34 was a particularly severe one.

The third object of the experiment, namely to collect antigenically different strains of virus, was not attained. It was only possible to collect virus from three of the 27 horses which died and these types were shown to be similar to, or identical with strains previously isolated. This finding is not unexpected since the work was carried out in the Pretoria District with strains which had been collected originally in the vicinity of Onderstepoort.

Summary.

(1) A total of 171 horses and 28 mules were immunized against horsesickness by means of neurotropic attenuated virus under field conditions in the season 1933-34.

(2) Immunization was effected by the injection of either a single strain of virus, by successive injections of two strains or by a single injection of a mixture of two strains.

(3) The total number of deaths following vaccination was 3 (1.8%), but since the animals in question died not later than the 5th day, it is believed that death was due not to the injection but to natural infection prior to immunization. This opinion is discussed.

(4) The number of breakdowns in immunity was 29; of these 2 or 1.2% recovered and 27 or 15.2% died. The significance of these figures is discussed.

(5) No new strains of virus were isolated.

(6) The laboratory observations on the safety and efficacy of this method of immunization have been confirmed under field conditions.

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Personalities.

Many of our colleagues will be pleased to learn that Sir Arnold Theiler has returned to South Africa and that he intends settling either in Pretoria or Johannesburg, where he will continue work on his favourite subject, namely the pathology of bone.

He has lost none of his enthusiasm and assiduity for work, and for all the 8 years he has been away appears very little changed. His interest in all South African veterinary problems is as great as ever, and it is most refreshing to discuss any subject with him and to get the benefit of his authoritative but detached views.

In our next issue we hope to give a more detailed account of his doings during the time he has been away and of his intentions for the future.

Meanwhile we extend to him and to Lady Theiler a very hearty welcome, and our best wishes for what we hope will be a long, pleasant and profitable sojourn in our midst.

Mr. J. H. L. Lyons, formerly G.V.O. at Cape Town, retired on pension on the 9th of December, 1934, after being in the Service since 1902. He joined the Cape Staff and did good work in clearing up lungsickness in the Fort Beaufort District. He was also responsible for detecting dourine at Smith's Drift. We understand that he intends settling down in private practice at Cape Town and we wish him every success in this new enterprise.

A Peculiar Selective Site of *Bacillus pyogenes* in Dairy Cows.

By G. MARTINAGLIA, M.Sc., D.V.Sc., Johannesburg.

Lucet (1893) found *B. liquefaciens pyogenes* as the most prevalent organism in suppurations of cattle in France and placed it next in importance to streptococci.

Künneman (1903) in Germany found a similar organism in 90% of suppuration in cattle. This organism he designated *B. pyogenes bovis.*

In America, Brown and Orcutt (1920) in their excellent study of the organism, described it from various disease processes and threw additional light on the biology of the organism. With Preisz, they are inclined to place *B. pyogenes bovis* in the genus of *Corynebacterium.*

On the Witwatersrand, this organism has been found associated with various suppurations, disease processes, and certain types of mastitis in dairy herds supplying milk to Johannesburg. It is not the intention of the writer to enumerate all the conditions in which this bacillus was encountered, but rather to draw attention to a peculiar site (in young heifers) often favoured by this organism.

In several dairies, it was observed that young heifers just before or shortly after calving developed a large induration on the supra-posterior aspect of the udder. These lesions are generally hard, warm, and painful to the touch, and usually terminate in a suppuration. The abscesses heal rapidly if opened up at the right time and thoroughly syringed out; if neglected a chronic thickening of the skin may result.

The organisms have not been encountered in the milk drawn from the affected udders, and seem to be confined to the subcutaneous tissue between the hind quarters of the udder. The mammary tissue does not seem to be involved. The suppurations are generally noted in heifers with first calves.

At first it was thought that tick bites or traumatic injuries might be the cause of these inflammations, but both theories were subsequently eliminated. This condition should not be confused with the posterior udder swelling which often follows calving.

Bacteriology.

From the abscesses, *Bacillus pyogenes* has been isolated in pure culture repeatedly; occasionally it was also found to be associated with

a staphylococcus. The organism answered to the best descriptions of *B. pyogenes,* its salient features being pleomorphism, the ability to coagulate milk followed by digestion of the curd and liquefaction of Löffler's serum medium. It produces a beta type of haemolysis on blood agar and on this medium, culturally, it can be mistaken for a haemolytic streptococcus.

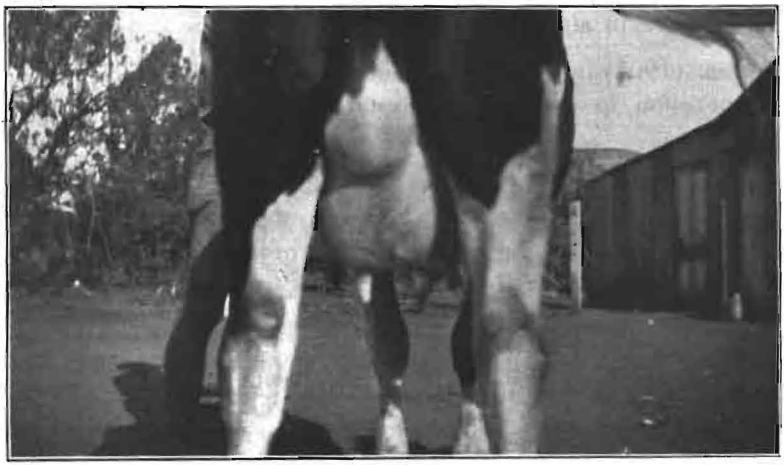

Fig. 9.—A typical posterior mammary abscess due to *B. pycgenes*

The above cultural features enable one to differentiate it easily from normal udder corynebacteria, especially the one recorded by the writer (1932).

Apparently, this organism is of wide distribution in the Transvaal and of common occurrence in various suppurating processes in dairy cattle.

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The Slaughter of Animals by Means of Electricity.

By W. E. FOOTNER, M.R.C.V.S., Durban.

Experiments in connection with the electrocution of animals have been conducted in Europe for many years, but although the Electrolethaler has been evolved for the slaughter of small animals and is being used in England and other countries with very satisfactory results, the same success does not appear to have been achieved in connection with the slaughter of cattle.

In an endeavour to discover an efficient method for the electrocution of cattle, a series of experiments have been conducted at Maydon Wharf, Durban, with the co-operation of Mr. E. R. Wadsworth, A.M.I.Mech.E., Chief Engineer of the Export Works, which have resulted in an Electric Collar having been devised which has electrocuted over 50,000 cattle with most satisfactory results.

The apparatus consists of a horseshoe-shaped collar completely insulated with the exception of two swivelling contacts at either extremity, which fit into the animal's neck. A great deal of importance is attached to this as the same results have not been obtained when the current is applied to other parts of the animal's body.

The animal having received a cold shower in the race—which serves the dual purpose of cooling it and ensuring a good contact for the collar—then enters the killing box, the collar is slipped over its neck from behind and the current switched on, the handle being advanced until the desired voltage is obtained, which is 160 volts a.c. The effect is of course instantaneous, and after the initial muscular contraction no movement takes place until the current is switched off, when the body collapses.

The current is left on for a period of thirty seconds, timed from an electric clock included in the circuit. This period of thirty seconds has been fixed for two reasons :—

(1) To ensure the actual death of the animal which is probably due to shock to the central nervous system, followed by paralysis of the respiratory and circulatory centres in the brain;

(2) It has been found that excellent bleeding is obtained by this procedure. This, I think, is probably to be ascribed to mechanical

influence, the muscular contraction protracted over this period forcing the blood out of the vessels, and partly to contraction of the muscular walls of the arteries themselves. Either a single or double current can be used. In the case of the single current the return is through the box to the secondary windings of the transformer.

The advantages of this method of slaughter may be classified under two headings :—

1. **Humanitarian.** There is an entire absence of blood in the killing box, the animal is quiet and unconcerned, and, as the collar is placed in position from behind, it experiences no sensation of fear as it must do when the operator advances towards it with a pistol or any instrument which has to be placed on the head.

These conditions are impossible to achieve with any other method of slaughter.

That unconsciousness is instantaneous I think we may accept, as all the evidence that can be obtained from people who have been electrocuted and recovered is that they experienced no pain whatever.

The method is foolproof, because the human element is entirely eliminated : there is no margin of error. The animal either gets the whole current or in the rare event of a fault occurring on the main supply, none at all.

2. **Economic.** Because the animal being despatched in a perfectly quiet and unexcited condition and because of the factors previously mentioned, bleeding is more complete. In consequence, the meat is brighter, more attractive in appearance, and the keeping properties are considerably enhanced.

This method of electrocution has been adopted by the Durban Branch of the Society for the Prevention of Cruelty to Animals, and is installed in their Dogs' Home where it is being used with entire success for the destruction of unwanted dogs. One thousand five hundred dogs have been despatched by this means.

Electrolethalling.

(Contributed.)

There has been so much discussion recently on the subject of the electrolethalling of animals that perhaps the following brief statement may be of interest to your readers.

There are two angles from which one can view the desirability of the use of electricity as a means of either rendering animals unconscious

or destroying them, i.e., the humane and the expedient.

From the point of view of expediency there is no doubt that the simplicity and rapidity of the use of electric current commends itself to everyone who has witnessed a demonstration of the various devices that have been put on the market in recent years. To all appearances the results are satisfactory—the animal drops to the floor almost instantaneously and shows no signs of life, there is no unsightly wound and no sound or cry, nor is the method as likely to have a brutalising effect on the operator, which is more than can be said of many of the old, and happily now more or less discarded, methods of slaughter or stunning, such as the hammer, the pole-axe, and the knife.

But humanitarians all over the world are disturbed at the ready way in which the use of electricity has been adopted in certain slaughterhouses and refuges for unwanted animals before any really scientific and thorough investigation has been carried out. It is true that certain devices have been tested and found to have the effect of rendering animals immobile and apparently unconscious, but no definite conclusion has been arrived at as to whether this immobility means unconsciousness or merely paralysis. Opinions vary radically.

For instance, Professor Muller, Director of the Munich abattoirs, in Germany, who has himself designed electrical stunning appliances, is a warm supporter of this method. On the other hand, Professor Carl Klein, Director of the Public Slaughterhouses in Lennep-Remscheid, Germany, says: "After apparently wonderful results, both from the point of view of our attempts to prevent cruelty and also in the matter of bleeding, I and others of my colleagues began to have serious doubts. . ." and after a full statement of his reasons and his experiences states: "The ideal of our efforts to protect our animals destined for slaughter is and always must be as follows: There must be no intermediate stage between the first onset of the operation . . . and the immediate loss of consciousness, followed by a painless death. This is what happens infallibly when the pistol-shot is used but not in the case of electric methods. I have therefore in my own slaughterhouse . . . returned to the tested method of injuring the brain by pistol Bolt." For the same reason the Director of the Municipal Abattoirs of Utrecht, Holland, decided against the use of electric devices, after the question had been investigated by the University Laboratory for Veterinary Physiology.

Even the views of the large European societies for the protection of animals vary somewhat. The R.S.P.C.A. has decided to recommend the use on pigs of the "Electrolethaller" as an alternative to the human killer, "provided that proper precautions are taken in regard to the provision of the apparatus and its use," but does not advocate the use of any electrical device for cattle. The President of the leading American

society says : " I have seen too many animals electrocuted come back to life and have to be put back again with the electric collar to believe that it is a humane method." The Scottish S.P.C.A., the Animal Defence Society of London and the University of London Animal Welfare Society are not in favour of electric stunning owing to the impossibility of knowing its real effect on the animal, but the latter society considers that under certain conditions the electric killing of small animals such as dogs might be humane.

As their Secretary, Captain Hume, B.Sc., says : " The difference between electrocuting (killing) and alleged electric *stunning* is that in the former case the current passes through the heart and is sufficiently high, while in the latter it passes through the brain and is kept low." He goes on to say that the current must pass along the body, when destroying an animal, and not be diverted through the legs, otherwise a sufficiently high proportion does not pass through the heart.

A Director of a well known engineering firm in England which has recently refused to make or market electrical apparatus for use in abattoirs states that the use of these devices is diminishing in England owing to the difficulty of avoiding either damage to the carcase by an overdose of the current, or failure to produce unconsciousness if insufficient is given.

In short, it appears that electricity as a means of destroying life is probably humane if certain approved and *scientifically* designed devices are used, but as a means of stunning it is extremely doubtful whether unconsciousness or merely paralysis is produced. One can only earnestly hope that until a really thorough and prolonged study of the electrical method has been undertaken by scientists, and some definite decision has been arrived at, humane-minded persons will refuse to adopt, or even sanction, its use.

May one hope that some animal protection society with the necessary funds will be persuaded to employ the services of one or two scientists to devote, if necessary, several months to a study of the subject, so that this tremendous and almost unknown force may be used to the best possible advantage or not be used at all.

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THE LAW AND THE VETERINARIAN. VI.

By C. P. BRESLER, M.A., LL.B., PRETORIA.

NEGLIGENCE.

I propose dealing with the question of negligence in this article, in so far as it is possible to deal with so big a subject in a few pages. Negligence, or *culpa*, may be defined as the failure to exercise towards another in given circumstances the care which the law considers a reasonable and prudent man would exercise towards him in those circumstances. (*Macintosh* Negligence in Delict, p. 3). As was said by *Wessels, J.* in *Elphick & Rickeberg*, 1920 T.P.D. 319, in discussing the phrase "due to the want of ordinary care or diligence of the owner or his servant" in section 38 (1) of Act 22 of 1916 (providing for the payment of compensation for injuries to stock killed on a railway) — "It seems to me that the words of the section are exactly the same as if the words were "due to the *culpa* or negligence on the part of the owner". *Culpa* and *diligentia* are two complementary terms: the one is the antithesis of the other. *culpa* is the want of *diligentia* and *diligentia* is the absence of *culpa*. In order to determine however whether in any particular case there has been a want of ordinary care or diligence (whether there has been *culpa* on the part of the owner) we must take the circumstances of the case into consideration, and judge from the circumstances whether the owner has acted as a prudent *paterfamilias* would act". "Legal negligence," said INNES, C. J., in *Union Government v. National Bank of South Africa, Ltd.*, 1921, A.D. 121, "consists in a failure to exercise that degree of care which, under the circumstances, it was the duty of the person concerned to use towards another. It involves, therefore, the existence of a duty to take care owed to the complainant." The question of *culpa* was fully discussed in *Skinner v. Johannesburg Turf Club* 1907, T.S. 852 by INNSE, C. J. The facts of the case briefly were that a horse belonging to a person using the ground of another for his own benefit, with the owner's permission, was killed by falling into a hole, the existence of which did not in the opinion of the Court constitute a hidden danger. The Court decided that in the absence of proof that a portion of the fence had been removed by the owner, and that such removal was the proximate cause of the damage, the owner was not liable. More precisely what happened was this: the defendants were the owners and had the control of certain ground known as the Johannesburg Race Course which was used by the defendants, by the Johannesburg Pony and Galloway Club, and by others for the racing and training of horses. On the 24th December, 1906, the plaintiff was permitted, and by virtue of his membership of the Johannesburg Pony and Galloway Club was entitled. to use the defendant's ground for the purpose of training Milkboy II. The plaintiff

alleged that near the six furlong starting-post between the inner and outer tracks, there was an open cutting or pit partly but insufficiently and negligently fenced in or protected, that the pit or cutting was a constant danger to persons using the ground for training purposes, that the defendants were aware of these facts, and that it was owing to defendants' negligence in not filling in or properly enclosing and protecting the pit or cutting that the plaintiffs' horse, while being lawfully ridden and trained on the ground, fell into the pit and was killed.

"The question we have to decide is whether the conduct of the defendants in allowing the hole to be there at all, or allowing it to remain unfenced, amounted to *culpa* so far as the plaintiff is concerned. I use the term *culpa*, because it is a term appropriate to the civil law; and the definition of *culpa* and its qualities have been carefully examined by the Roman lawyers. It is true, as Mr. Leonard says, that the scope of the *lex Aquilia* was narrower than that of the actions which we recognise under the head of 'negligence'. Still, the fundamental idea of *culpa* was exhaustively considered by the Roman lawyers and on that point I should like to refer to the opinion of POLLOCK, (*Torts, 3rd Ed.*, p. 17): '*Culpa* is exactly what we mean by negligence, the falling short of that care and circumspection which is due from one man to another. The rules specially dealing with this branch have to define the measure of care which the law prescribes as due in the case in hand. The Roman conception of such rules, as worked out by the lawyers, of the classical period, is excellently illustrated by the title of the *Digest, ad legem Aquilliam*, a storehouse of good sense and good law (for the principles are substantially the same as ours), deserving more attention at the hands of English lawyers than it has ever received.' Roughly speaking, I should express the essential features of *culpa* this way—that it was a failure to exercise that care, or to observe that conduct, which under similar circumstances, a *diligens paterfamilias* (who was the Roman equivalent of the English 'reasonable man')—would have exercised or observed. But the Roman lawyers recognised that the standard of care to be observed must vary with the varying circumstances of each case: because even a reasonable man would not always exercise the same degree of care and skill: it would depend upon the circumstances with which he was confronted. Thus we find that in the *Digest*, treating of the case of a man who digs a pit for wild animals, it is laid down that if he constructs such a pit in the place where persons are in the habit of passing, he is bound to take more care and more precautions to prevent mishaps than if he did the same thing in an unfrequented place. The distinction is obvious. In the one case there is more reason to anticipate danger than there is in the other. But though the standard varies with the circumstances of each case, it is the duty of every person to observe that standard as ascertained by the Court in each instance. If there is a failure to do so, then that breach of duty constitutes what the Roman law

would call *culpa* and the English law negligence." (One might be permitted to utter a warning at this stage not to rely too strongly on English precedents by reason of the fact that the standpoint of the two systems is different.). MACINTOSH points out that there are two elements in the conception of the diligence which characterises what he calls a "reasonable prudent man". The one is, that the diligence required is not (per DE VILLIERS, J. A., in *Transvaal Administrator* v. *Coley*, 1924, A.D. p. 27) the diligence of a supine man, but of the man who is alive to possible dangers and takes the necessary steps to guard against them. The other element is that nevertheless it is not the highest possible diligence that is required, but only such diligence as, according to the ordinary standards of life may reasonably be demanded. In the last resort the diligence of the *diligens paterfamilias* is the diligence which the Court, guided by precedent, thinks could fairly and reasonably be expected of a careful man in the circumstances.

Whether there are degrees of care in delict is a matter of some difficulty. *In lege Aquilia et levissima culpa venit*,—so that the standard seems to remain that of the "reasonable prudent" man. In *Jameson's Minors v. C.S.A.R.*, 1908 T.S. 586, INNES, C. J., seemed disinclined, in an action on tort to decide the point. "And though the words gross, ordinary or slight are useful as indicating different degrees of want of diligence, they tend to confusion when used to denote distinct species of negligence, one of which, and no other, is required to entail liability in one set of cases, and another of which is similarly essential in another set of cases. For these reasons it seems to me advisable in inquiries relating to the existence of negligence to draw no distinction between gross and ordinary negligence unless compelled to do so by authority. That strong authority in that direction exists in regard to claims founded on contract cannot be questioned. Its existence was recognised by this Court in *Central South African Railways v. Adlington*, 1906, T.S. 964. But it is not necessary to discuss that aspect of the question, because this is an action founded on tort." In *Venter v. Levenstein*, 1911, E.D.L. 261, KOTZE, J. P., said that in actions based on *culpa* and sounding in delict the phrase gross negligence was a "legal barbarism". However, although there is eminent authority dissenting from that conclusion, the practical effect is not very significant. Certainly in an article of this description legal refinement is out of place.

I think that reference to a few decided cases of interest will illustrate the application of the general principle of negligence. Where sheep were being driven through a street by a herd who, in the proximity of a horse and cart, cracked a whip making the sheep scatter and causing the horse to bolt, it was held that the herd was negligent and that his master was liable in damages. (*Goldblum & Glass v. Bolton*, 1921, T.P.D. 36). Where defendant's horse, which had previously been seen running

wildly and recklessly on certain War Department property, ran over and injured the plaintiff's minor child, it was held that defendant was negligent in allowing his horse to run unattended on property which he knew to be frequented by children (*Joyce v. Arlosoroff*, 24 S.C. 45). The placing of a bundle of wood about a yard from the side of a public road is not such an act of negligence as to render the person who placed it there liable in an action for damages at the suit of a person whose horses had taken fright at the bundle and upset a cart which they were drawing (*Walters v. Lucas*, 7, S.C., 153). Where defendant was in the habit of allowing his horses to remain with harness on but with bridle or halter loose in a yard open to the street and one horse so left loose suddenly bolted through an unused door from the yard into an unfrequented lane, and thence into the main street, and there collided with and upset a cart in which plaintiff was driving, it was held that defendant was guilty of negligence and was liable to plaintiff for damages for the injuries he had received in consequence of having been thrown out of the cart. (*Wiblin v. Webber*, 10, E.D.C. 71).

In an action to recover damages for the loss of sheep which had died from arsenical poisoning after they had been dipped in a solution of powder manufactured and sold by defendants, plaintiffs alleged that the death of the sheep was due to the presence of an excess of arsenic in certain four packets of the powder which he had added, together with more than the quantity of water specified in defendant's printed instructions to a solution through which the sheep had already been passed without injury. It was held on appeal, that plaintiff had not upon the evidence discharged the burden which lay upon him of proving that the death of the sheep was due to an excess of arsenic in the four packets of powder. It is interesting to note that among the witnesses in this case was the veterinary officer of the Free State at the time. (*Cooper and Nephews v. Visser*, 1920 A.D., 111).

Defendant's servants in harnessing a pair of horses, one of which was restive and high-spirited, to a wagon affixed a bridle to the restive horse in such a manner that it was able to shake off the bridle, as a result of which the driver lost control of the horse which became frantic, causing both horses to bolt, the driver to be thrown from his seat and the wagon eventually to collide with plaintiff's motor car causing it damage. It was held that the damage was due to the negligence of defendant's servants (*Page v. Malcomess & Co.*, 1922, E.D.L. 284).

Where owing to defendant's failure to maintain a gate in a fence dividing two camps belonging to plaintiff, plaintiff's stock rams became mixed with certain of his stud ewes, it was held that the damage was not too remote and should be awarded to the plaintiff (*Probart v. South African Railways & Harbours*, 1926, E.D.L., 205).

Defendant's servant, in taking an unhaltered horse across a public road at a walking pace emerged on to the road from a lane abutting on the road, and not visible to persons on the road until they were almost opposite it. A motor cyclist proceeding along the left of the road at a moderate pace, in swerving to avoid the horse, fell and sustained injuries. The road was one along which electric trams ran and fast-moving traffic was to be expected. The defendant's servant failed to take the precaution of observing the traffic before allowing the horse to enter upon the road. It was held that the failure of the servant to take this precaution was in the circumstances negligent. (*Lindeque v. Hall*, 1927, T.P.D., 417).

These somewhat simple cases may serve to illustrate the operation of the principle in so far as we have discussed it.

It now becomes necessary to refer briefly to what is known as the dictrine of "contributory negligence". The doctrine is well established, but its application is one of extreme difficulty. MACINTOSH puts the general proposition in the following words: "The mere fact that the defendant has been negligent will not necessarily entitle the plaintiff to succeed; for by his own negligence he may have barred himself. Nor yet will the mere fact that the plaintiff was also negligent necessarily absolve the defendant; for the plaintiff's negligence may not have been a vital negligence. In every case after the enquiry whether the defendant was negligent, will come a further enquiry—namely, whose negligence was the vital; the decisive, the 'proximate' cause of the harm?" In *Broughey v. Bredell*, 1904, T.S. 294 INNES, C. J., expressed the doctrine in the following way. "To disentitle a plaintiff to succeed when negligence on the part of the defendant has been established, it must be shown that in spite of that fact an accident would not have happened but for the negligence of the plaintiff; in other words, that the negligence of the plaintiff was the proximate cause of the mishap. That is perhaps not quite a happy mode of expressing it; but that is the way the doctrine is often stated. If there is negligence on the part of the plaintiff in the final or critical stage and that negligence causes the accident, the plaintiff would be disentitled to succeed. This is how POLLOCK puts it in his book on *Torts* (4th Ed. p. 413): 'The received and usual way of directing a jury is to say that if the plaintiff could, by the exercise of such care and skill as he was bound to exercise have avoided the consequence of the defendant's negligence, he cannot recover. That is to say, he is not to lose his remedy merely because he has been negligent at some stage of the business, though without that negligence the subsequent events might not or could not have happened; but only if he has been negligent in the final stage and at that decisive point of the event, so that the mischief, as and when it happens, is immediately due to his own want of care and not the defendants'." There is also the doctrine of simul-

taneous negligence, e.g. where both parties were negligent but neither had any opportunity of avoiding the consequences of the negligence of the other. But I do not think that for the purpose of this article this aspect justifies detailed attention.

Veterinarians will in practice find themselves subject to the same law as that which governs medical practitioners. Both carry on professions demanding skill and knowledge, but it is not required of them that they exhibit the highest possible degree of professional skill—*vide Mitchell v. Dixon*, 1914, A.D. 519. In that case the defendant Dixon while acting as assistant to another medical practitioner was called in to attend to the plaintiff. Both doctors diagnosed that he was suffering from pneumothorax and the defendant inserted a syringe fitted with a steel needle into the plaintiff's back in order to explore the chest cavity and give relief. The needle broke off in the plaintiff's back whereupon the defendant and his principal made an incision to find the needle and to relieve the plaintiff. They failed to find the needle, but according to their evidence there was a marked escape of air from the incision proving the presence of pneumothorax. Relevant passages from the judgment read as follows:—"But before entering upon any discussion of the facts, it is desirable to say a word about the legal aspect of the matter. The plaintiff's claim is based upon negligence, that is, upon the absence of that reasonable skill and care which the law requires under the circumstances. A medical practitioner is not expected to bring to bear upon a case entrusted to him the highest possible degree of professional skill, but he is bound to employ reasonable skill and care; and he is liable for the consequences if he has not. The burden of proving that the injury of which he complains, was caused by the defendant's negligence, rested throughout upon the plaintiff. The mere fact that the accident occurred was not in itself *prima facie* proof of negligence. Because the needle might have been fractured by causes beyond the control of the operator—by the movement of the patient for instance. So that the maxim *res ipsa loquitur* could have no application. To justify a decision in his favour, therefore, the plaintiff was bound to establish negligence. And in enquiring whether the finding of the jury can stand, the test to be applied is not whether this Court would have arrived, upon a consideration of the record, at the same conclusion; but whether the verdict was one, which men, acting reasonably and duly instructed, could not properly have returned. . . . . In the first place, it was strenuously argued both before the jury and on appeal, that there had been a wrong diagnosis of the complaint; that at no time prior to the operation had the patient suffered from pneumo-thorax; that there was no necessity to explore the chest cavity; that the needle should never have been inserted; and that the defendant was responsible for a needless operation . . . . Now a medical practitioner is not necessarily liable for a wrong diagnosis. No human being is infallible: and in the present state of science, even the

most eminent specialist may be at fault in detecting the true nature of a diseased condition. A practitioner can only be held liable in this respect, if his diagnosis is so palpably wrong as to prove negligence. That is to say, if his mistake is of such a nature as to imply an absence of reasonable skill and care on his part, regard being had to the ordinary level of skill in the profession .... The next proof of negligence relied upon was the one specifically mentioned in the declaration, namely that defendant did not use a proper instrument .... But this part of the case broke down .... In the first place the defendant used the needle ordinarily supplied with the instrument .... It was next contended that the needle was inserted in the wrong place .... But there was a great weight of medical opinion which found no fault with the place described by Dr. Mitchell .... It was urged that the fracture of the needle was due to the negligent conduct of the defendant. Now .... the break must have been caused in one of four ways:—

(a) by a sudden movement of the patient;

(b) by a sudden movement of the operator;

(c) by coming into contact with a bone or sudden ridge of muscle;

(d) by a flaw in the instrument;

.... but a consideration of all the evidence bearing upon this part of the case satisfies me that it would be quite unreasonable to hold that it has been established that the actual breaking of the needle was due to negligence on the part of the operator ... There remains only the last contention advanced on behalf of the plaintiff. It was argued that the defendant was negligent in not promptly extracting the broken needle .... Now Dr. Mitchell states that he did have a forceps, but that the needle was not exposed and that therefore he could not use it. He used his fingers and then probed with a narrow scalpel and failing to come upon the head of the needle, he went to Dr. Howden. After administering chloroform, he made an incision, hoping to expose the steel, but intending in any event to relieve the patient. Having effected the latter purpose, it was not considered desirable to prolong the operation in the then condition of the patient. I fail to see how it could be held with any reason at all that the defendant was negligent in not then and there continuing his cutting operation until the needle was exposed and removed."

In *Van Wyk v. Lewis,* 1924, A.D., 438, a number of legal propositions of great importance were considered by WESSELS, J. A. In that case the defendant, a surgeon, performed an urgent and difficult abdominal operation upon plaintiff. The operation took place in a hospital at night and defendant was assisted by an anaesthetist and a qualified nurse on the hospital staff who acted as theatre sister. At the conclusion of the

operation one of the swabs used by defendant was overlooked and remained in plaintiff's body from which it passed after a lapse of twelve months. In his judgment WESSELS, J. A. said: "I think that the law necessary for the decision of the case may well be stated in a series of propositions:—

"(1) The contract between a patient operated upon in a hospital and the operating surgeon is that the surgeon will perform the operation with such technical skill as the average medical practitioner in South Africa possesses and that he will apply that skill with reasonable care and judgment.... A surgeon must exercise towards his patients such reasonable care and skill as is usually exercised by surgeons of good standing in the community in which he resides....

"(2) The general method or general system of operating in a modern hospital is an important factor in judging whether a surgeon operating in a hospital has exhibited a reasonable degree of skill, care and judgment.... The general rule of law is that where a reasonable trade usage is of universal application in a community or where a form of professional practice is generally adopted by a particular profession, a person who deals with the trade or profession is impliedly bound by the usage or practice of the profession.

"(3) The relation of a hospital sister or nurse in a public hospital to a surgeon operating in that hospital is not that of master and servant nor is it analogous to such a relationship. The sister or nurse is an independent assistant of the surgeon, though under his control, in respect of the operation.... The truth is that hospital sisters and nurses form a distinct branch of the hospital. They are members of an allied profession and have duties of their own to perform. They are subordinate to the surgeons, but they are in no way their servants. The surgeon is not responsible for what the nurse does in the sense that a master is responsible for the acts of his servant. The surgeon does not insure that he will be responsible for every misfeasance of the nurse. To make him so would make his position intolerable.

"(4) In determining whether a surgeon in conducting an abdominal operation in a hospital is entitled to place reliance on the counting of the swabs by a qualified and competent hospital sister and whether by so doing he has exercised a reasonable degree of skill care and judgment, we must consider the prevailing practice of the profession and all the circumstances surrounding the operation.... If those taking care of the patient are ignorant or inexperienced it is conceived that the doctor should instruct them. On the other hand if the surroundings are those of the modern hospital. with experienced nurses and attendants, the doctor ought to be entitled to take for granted, that they will attend to their ordinary duties without instruction....

"(5) Not only must we take into consideration the practice of the profession, the place where the operation is conducted, the qualifications of the attendants, but the nature of the operation and the circumstances surrounding it . . . We cannot determine in the abstract whether the surgeon has or has not exhibited reasonable skill or care. We must place ourselves as nearly as possible in the exact position, in which the surgeon found himself when he conducted the particular operation and we must then determine from all the circumstances whether he acted with reasonable care or negligently. Did he act as an average surgeon placed in similar circumstances would have acted, or did he manifestly fall short of the skill, care and judgment of the average surgeon in similar circumstances. If he falls short he is negligent . . . ."

In deciding whether a treatment was reasonable the Court will consider all the circumstances, such as urgency and isolation. (*Webb v. Isaac,* 1915, E.D.L.,273),

The case of *Hewat v. Rendel,* 1925, T.P.D. should be distinguished. *After* an operation had been concluded, a doctor handed over to a nurse a specimen he had taken for transmission to an Institute of Medical Research; it was held that he would be liable for her negligence in failing to transmit it because that was no independent duty of hers, but she was the agent of the doctor for transmitting, it being the doctor's duty to ensure transmission. So too must the case of *Dale v. Hamilon,* 1924, W.L.D. 184, where it was held that a doctor who himself uses X-ray apparatus on a patient must satisfy himself that such factors of safety as the distance of the tube are properly arranged, and is not justified in relying on the apparatus having been correctly adjusted when set. In *Lymbery v. Jefferies,* 1925, A.D., 236, the defendant advised the plaintiff to go to one A. for X-ray. A. was not a qualified medical man but a layman with knowledge and experience of X-ray work. The Court held that this did not make A. his agent: "If a medical man advises a patient to be treated by some third person, either because he cannot give the treatment himself or because it is customary to entrust it to a third person, the latter does not in general become the agent of the first."

Akiron.

A new preparation for the treatment of Piroplasmosis, Babesiellosis, and Nuttalliosis.

(Reprinted from News Letter No. 23 to G.V.O's.—N.B. Reproduction in any form of information contained in this article is strictly prohibited.)

ADVANTAGES OVER TRYPAN BLUE.

Trypan blue and its derivatives have been used extensively for the treatment of piroplasmosis and babesiellosis with good results. Those who have used this drug extensively know only too well the difficulties experienced in administering this drug, e.g. :—

(1) Large quantities have to be injected intravenously;

(2) When given subcutaneously or when the intravenous injection is faulty, abscesses develop;

(3) The tissues become stained and the blue discolouration can be detected for months;

(4) Trypan blue is excreted through the milk up to five days after injection;

(5) Dogs suffering from biliary fever show relapses after treatment.

A new drug "Akiron" has recently been placed on the market by the firm of Bayer, and excellent results have been obtained. From the available data it has been found that the action of this drug is not only more reliable than trypan blue but its administration is very easy.

GENERAL PROPERTIES OF AKIRON.

"Akiron" is a urea derivative, has a light yellow colour and is water soluble. When given alone in large doses it causes a powerful and lasting decrease in the blood pressure as well as intestinal contractions. Furthermore, it has been noticed that shortly after administration the drug may reveal ill effects in the form of fear, foaming from the mouth, restlessness, lying down, dyspnoea, muscular tremors, defecation and stupor. In order to overcome this difficulty an analeptic *Rephrin*, a combination of *Recradin* and *Suprarenin* is added to the "Akiron" solution and this preparation has been found to be very suitable. No bad effects will be observed, or at least they are reduced to such a minimum that they can easily be tolerated.

With regard to dosage, consideration should be given to both Akiron and Rephrin components. In this respect it may be pointed out

that in their action on the blood-pressure they are direct antagonists and may therefore be employed in maximal doses. It is also advisable not to administer the drug intravenously but *intramuscularly or subcutaneously*.

Chemotherapeutic Properties.

These properties were first tested in experimental cases of piroplasmosis in dogs and later in piroplasmosis and babesiellosis of cattle, and nuttalliosis of horses. It was found that :—

(1) When the injection was given on the 2nd day after injecting the experimental animals intravenously with *Piroplasma canis*, the incubation period was increased several days;

(2) When the drug was administered in fresh cases of piroplasmosis, and blood smears examined at hourly intervals, a definite decrease in the number of parasites occurred after a few hours and many degenerative forms were visible. After 24 hours no parasites or practically no parasites could be detected. With disappearance of the parasites the temperature usually returns to normal.

The experience with this drug at Onderstepoort has been very satisfactory. In biliary fever of dogs obstinate cases occur which do not promptly respond to the action of trypan blue and it becomes necessary to repeat the treatment. Experience has shown that such cases may also be met with in respect of Akiron treatment but satisfactory results are obtained when the treatment is repeated.

In view of the prompt way in which the parasites respond to this drug it is believed that very large doses may lead to complete sterilization. This point has not been cleared up and experiments on these lines are at present being undertaken.

Several workers claim very good results with Akiron in connection with *Nuttallia equi* and *Piroplasma caballi*. Suitable subjects have up to now not been available to carry out experiments on these lines at Onderstepoort.

Summary.

In experimental and naturally contracted piroplasmosis Akiron has been found to be much more effective than trypan blue. It is not a dye, and therefore does not discolour the tissues, and does not give rise to irritation or abscess formation when given intravenously or subcutaneously.

Dosage.

(1) **Cattle.** 10 cc. of a 5% solution of Akiron should be injected intramuscularly or subcutaneously and not intravenously as mentioned above in this article.

The dose given is for strong animals weighing on the average about 500 Kg. and the dose should be correspondingly reduced for smaller animals (e.g. for an animal weighing 250 Kilos half the dose should be injected).

Should the parasites not respond to the first injection a second dose may be given after 24 hours or when a relapse does occur.

(2) **Horses.** 3 — 6 cc. of the 5% solution of Akiron intramuscularly, according to size.

(3) **Sheep.** 1 cc. of the 5% solutoin of Akiron intramuscularly.

(4) **Dogs.** The dose for dogs is made up as follows: Add 5 cc. of the 5% solution of Akiron to 95 cc. of sterile normal saline. Of this solution i.e. 0.25% inject intramuscularly 1 cc. for every 10 Kg. body weight. This solution will keep well and can be used as required.

NOTE.—**Akiron** is sold under the name **Akiron R,** which means that rephrin has been added to the Akiron solution for reasons mentioned earlier in the article.

Conclusion.

" Akiron " has been tested extensively under laboratory conditions and to a lesser extent under field conditions with excellent results. The Director of Veterinary Services, Onderstepoort, however, would appreciate it very much to obtain the opinion of veterinarians on the efficacy of this drug under field conditions, since they are called upon to treat cases of piroplasmosis at different stages of the disease.

Myiasis in Domestic Animals due to *Cordylobia anthropophaga.*

(Reprinted from Departmental News Letter No. 22 to G.V.O's.)

Reports are occasionally being received at Onderstepoort of cases of cutaneous myiasis due to certain fly larvae which in many respects resemble small larvae of the ox warble fly, *Hypoderma* sp. These maggots belong to the same group as those of the blowflies and flesh flies

and are white in colour, pointed anteriorly and blunt at the posterior extremity. The body is armed with a large number of minute, black spines.

Dogs are the chief sufferers, the maggots occurring mostly in the skin of the paws around the toes or along the lower portions of the body. Rabbits may also become badly infected. Goats and occasionally sheep are attacked, the scrotum and those portions of the body coming into contact with the ground when resting being the commonest sites of infection. It is quite conceivable, however, that other species of domestic animals could occasionally harbour the maggots under the skin and man is not infrequently also a sufferer.

Cordylobia anthropophaga known in Central Africa as the "Tumbu Fly," is a dull brown, thick-set fly varying in length from one-quarter to almost three-quarters of an inch. The wings are transparent and colourless, the abdomen is rounded and two faint, greyish-black, longitudinal bands are apparent on the thorax.

The life history is not accurately known but the fly is believed to lay its eggs on the ground in the resting places of animals, particularly where there is a smell of sweat or urine. The larva, on coming into contact with its host, burrows its way into the skin where it forms a large swelling, having a central opening which is partially filled in by the posterior extremity of the larva and through which it breathes. The larva grows mature in 12—15 days and then drops out to pupate in the ground. In the case of human beings the eggs are frequently laid on clothes saturated with perspiration and hung out to dry.

Treatment consists of the removal of the larvae by means of a fine pair of forceps or a knife blade and injection into the cavity of a small quantity of disinfectant, e.g. tincture of iodine. Healing takes place readily once the maggot has been removed.

BOOK REVIEW.

Précis de Droit Vétérinaire[1] (1934) by F. Liégeois, Professor at the Cureghem Veterinary School.

Since the veterinarian in his capacity of expert is not infrequently called upon to place his professional knowledge at the disposal of courts of law in litigation concerning animals and their products, it stands to reason that he should have some elementary notion of law and legal procedure.

(1) One volume in 8°, 331 pages brochure 50 fr., bound 65 fr. Publishers Jules Duculot, Gembloux, Belgium.

Even should his services in this connection be required only at rare intervals, it must be remembered that in his daily contact with his clients he is often and at times unconsciously required to advise on matters which have or may have legal importance or sequelae. In fact, the practice of Veterinary Science in general involves certain legal aspects or obligations which cannot be avoided. Whether the veterinarian be engaged in private practice, State service, meat inspection or other pursuit in his profession, his particular sphere will inevitably call for some knowledge of the various laws governing such an important part of a country's wealth, namely its animals.

Realising this, all progressive veterinary schools include in their curriculum a course of veterinary jurisprudence. The latest treatise on this subject comes from Belgium. In a book of 331 pages Prof. Liégeois deals systematically and exhaustively with the law as it affects the veterinarian.

The subject matter is conveniently divided into four parts as follows :—

Part I comprises elementary notions of law such as

Legislation — Acts, regulations, orders and their interpretations.

Judiciary organisation — the various courts and how they are constituted.

Legal procedure — evidence, etc.

Incidentals of procedure — expert evidence, its meaning and value, fees, medico-legal consultation.

Part II deals with legal veterinary medicine proper.

a. Responsibilities of a general nature, e.g. damages, negligence, ownership, theft, trespassing, cruelty, compulsory destruction, hiring, transport, boarding, etc.

b. Responsibilities of a professional nature are enumerated and treated at length, e.g. the various pathological, toxicological and surgical accidents.

Part III deals with commercial legislation particularly in regard to sale and exchange of animals, warranties, redhibitory vices, etc.

Part IV is a resumé of veterinary professional legislation as affecting veterinary education, legal recognition and protection.

An appendix gives specimen forms of the various certificates a veterinarian may be called upon to furnish.

A. D. T.

Titles of Theses of Interest to Veterinarians.

UNIVERSITY OF SOUTH AFRICA.

(This University was constituted in 1916 as the legal successor to the University of the Cape of Good Hope, which received its Charter in 1877.)

D.Sc.[1]

YEAR.	AUTHOR.	TITLE.
1921.	Neser, C. P.	The Blood of Equines.
1925.	Stammers, A. D.	Contributions to the Study of Animal Nutrition with special reference to the Vitamins.
1933.	Parkin, B. S.	The Trypanosomiases of Domestic Animals of the Union of South Africa.

D.V.Sc.

1929.	Quin, J. I.	Studies on Anthrax Immunity.
1929.	Quinlan, J. B.	Researches in Sterility of Cows in South Africa.
1929.	Thomas, A. D.	Skin Cancer of the Angora Goat in South Africa.
1930.	Robinson, E. M.	The Bacteria of the *Clostridium botulinum* "C" and "D" types.

*M.Sc. and M.A.**

			College [2]
1924.	Brock, G. T.	The Digestive System of the Ostrich.	R.U.C.
1928.	Boyd, E.	Blackheaded Persian Sheep.	R.U.C.
1928.	Ross-Spencer, M.	The Coat of the Angora.	R.U.C.
1929.	Pretorius, P. J.*	Health Administration of the Union of South Africa.	T.U.C.
1929.	Bell, D. G.	Wool Studies.	R.U.C.
1929.	Otto, J. S.	Micro-method for the Detection of Antimony in organic material and its course through the Animal Body.	T.U.C.
1930.	Wormser, M. F.	The Ostrich Industry in South Africa.	T.U.C.

* No thesis is required for the degree of Bachelor.

(1) See Theses for Doctorate by M. H. V. Brown and H. H. Curson. *Jl. S.A.V.M.A. IV* (3), 1933.

(2) R.U.C.= Rhodes University College; P.U.C.= Potchefstroom University College; T.U.C.= Transvaal University College.

Year.	Author.	Title.	
1930.	Botha, P. S.	The Transformation of the Birth Coat of the Merino into the Fleece of the Adult.	R.U.C.
1930.	Petty, B. K.	The Variation and Classification of Mohair.	R.U.C.
1930.	Lampen, G.*	Dier Sielkunde.	P.U.C.
1930.	Whitnall, A. B. M.	(a) General Variation in some Domestic Mammals; (b) The Effect of the Blowfly Maggot on the Skin and Wool of Sheep.	R.U.C.
1931.	Dowsley, E. d'A.*	An Investigation into the Circumstances relating to the Cattle-killing Delusion in Kaffraria, 1856-1857.	R.U.C.
1932.	Schaefer, E. E.	The Yolk and the Yolk Glands of the Merino Wool Fibres in the Grease Staple: Their crimped length, straight length, and thickness.	R.U.C.

University of the Witwatersrand.

(This Institution, formerly a constituent College of the University of South Africa, attained University status on 1st March, 1922.)

D.Sc.

1928.	De Kock, G. v. d. W.	A Study of the Reticulo-endothelial System of the Sheep.	

M.Sc.

1923.	Mettam, R. W. M.	Snotsiekte, a Disease of South African Cattle.	

University of Pretoria.

(The Transvaal University College became the University of Pretoria on 10th October, 1930.)

D.V.Sc.

1931.	Bekker, J. G.	The Administration of Phosphorus to Cattle in their Drinking Water.	

* No thesis is necessary for the degree of Bachelor.

Year.	Author.	Title.
1932.	Graf, H.	Comparative Chemical Studies on Laked and Unlaked Blood Filtrates of Domestic Animals in Health and Disease.
1933.	Steyn, D. G.	The Toxicology of Plants in South Africa.

D.Sc.

1931.	Kamerman, P.	The Poisonous Principles of *Cotyleden orbiculata* and Additional Papers.

*M.Sc., M.Sc. (Agric.), M.A.**

1931.	Du Preez, J. J.	The Kaffir Corns—Their Capacity and Yielding Capacity.
1932.	Spamer, C. N.*	Marketing of Poultry and Poultry Products.
1932.	Hamersma, P. J.	'n Studie van sommige Organiese Bestanddele in gehemoliseerde en ongehemoliseerde Bloed van Merino Skape.
1932.	Oberholzer, P. C. J.	Die ontbinding van Somer-groeiende groenbemestings gewasse in die rooi sanderige leemgronde van die Univerteitsproefplaas, Pretoria.
1932.	Murray, C. A.	Investigations into the Production of Bacon Pigs in South Africa.
1932.	Kotze, P. L.	'n Objektiewe Studie van die oordragingsvermoë van kwantiteit en kwaliteit melk van Fries Bulle in die Unie.
1933.	Murray, G. N.	A Statistical Analysis of Growth and Carcase Measurements of Baconers.
1933.	Rowland, J. W.	(1) Veld Analysis in relation to Pasture Management in the Potgietersrust District. (2) Some veld types in the Potgietersrust area of the Northern Transvaal and their response to grazing.
1933.	Hambrock, H. A.	An Investigation into the Effect of Arsenical Dips on Wool.
1933.	v. d. Merwe, J. P.	Verteringsproewe met Pluimvee.

B.Sc. (Agric.).

1932.	J. F. du Toit	Eksperimente in verband met kleuraanpassing by sprinkane.

1932.	C. J. B. Smit	Die Lewensgeskiedenis van die Rooivlerksprinkaan *Nomadacris septemfasciata* (Serv.) met spesiale verwysings na die ontwikkeling van die onvolwasse stadia.
1933.	J. W. C. Geyer.	Die Lewensgeskiedenis van die Woestynsprinkaan *Schistocerca gregaria* met spesiale verwysing na die ontwikkeling van die onvolwasse stadia.

Botany.

1932.	J. W. Rowland.	Preliminary Analysis of the Grazing Conditions on a Potgietersrust Farm.

Chemistry.

1932.	J. P. Botha.	A preliminary study of the composition and carrying capacity of Rhodes and Woolly Finger Grasses as influenced by fertilizer treatment and system of grazing.

Agricultural Economics.

1932.	F. J. C. Cronje.	Moontlikhede van Vetlamproduksie in Suid-Afrika.

Animal Husbandry.

1930.	J. A. du Plessis.	Verbetering van ons Vleesbeeste en Beesvleis Nywerheid.
	J. H. Janssen.	Die Sog as Melkproduseerder.
	J. D. le Roux.	Verteerbaarheidsproewe met Varke.
	W. S. Maxwell.	Digestion and Nitrogen Metabolism Trials with Pigs.
1931.	J. C. Bonsma.	The Influence of Nutrition on the growth and production of Wool.
	G. B. Laurence.	The Effect of Nutrition on the Sulphur Content of Merino Wool as indicated by the differences between the Sulphur Content of the Wool of Sheep under controlled nutritional conditions and of Sheep on ordinary pastoral conditions.

	P. M. Oosthuizen.	The Effect of Nutrition on the Sulphur Content of Merino Wool as indicated by the differences between the Sulphur Content of the Wool of Sheep under controlled nutritional conditions and of Sheep on ordinary pastoral conditions.
	E. E. Meyer.	Verteerbaarheids- en Balansproewe met Skape.
	L. A. Pepler.	Die Hansgrootmaak van Vers-kalwers op 'n minimum hoeveelheid Volmelk plus 'n ekonomiese Substituut.
1932.	P. J. Theron.	The Sheep and Mutton Industry of South Africa with special reference to the Johannesburg Sheep and Mutton Market.
	E. E. J. van der Horst.	Die Sog as Melkproduseerder.
	L. L. Zeeman.	Die Sog as Melkproduseerder.
	H. C. Bonsma.	The Influence of Nutrition on the Uniformity of Fineness along the Length of Merino Wool.
	D. J. Engela.	A Digestion and Balance Trial with Sheep.
1933.	D. J. Louw.	The Influence of Nutrition on the rate of Growth and Sulphur Content of Wool.
	J. S. Starke.	Woolfat and Suint in Merino Sheep. Distribution over the Body and Effect of Nutrition and Season thereon.
	P. J. Joubert.	An Investigation on the Sulphur Content of Wool. Its Distribution and Relationship to Fineness and Quality.
	A. A. Read.	The Milk production of Sows and the preweaning growth of the litters.
	A. A. Potgieter.	Die weeklikse melklewering van die sôë vir 8 weke. Die invloed van die laktasie-periode op die weeklikse gewigte van die sôë. Die ontwikkeling van die werpsels gedurende die laktasie-periode van 8 weke.
	C. F. Ziervogel.	Ondersoek in die Probleme verbonde aan Wolproduksie op die Hoëveld van die Oostelike Transvaal.

Dairying.

D. T. van Rooyen.	An Investigation on the Quality of the Pretoria City Milk Supply.
P. du Preez.	Mechanical Losses in the Creamery and their effect on Overrun.
C. Lyle.	The Use of a Starter in Butter Manufacturing.
H. J. Penning.	A Comparative Study of the Quality of Butter Manufactured from Raw Cream and Raw and Pasteurized Cream in which the Acidity has been standardised.
R. Sive.	The Effects of Starters in the Manufacture of Butter on Flavour and Keeping Quality.

H. H. C.

ASSOCIATION.

Minutes of Council Meeting held at Polley's Hotel, Pretoria, on 3rd December, 1934, at 8 p.m.

Present: Messrs. F. J. Carless (in the Chair), A. D. Thomas, H. H. Curson, C. Jackson, A. C. Kirkpatrick, D. G. Steyn and M. H. V. Brown (Acting Secretary).

1. **Confirmation of Minutes.** The minutes of Council Meetings held on 10/8/34 and 5/9/34, were taken as read and confirmed .

2. (a) **Status Committee's Report.** In view of the fact that no communication had yet been received from the Secretary for Agriculture and Forestry in reply to the two alternative suggestions proposed to him, it was agreed that a reminder be sent, and in addition that Mr. Clark's specified offer be drawn to his attention.

(b) **Association of Private Practitioners.** The Acting Secretary intimated that a delegate to act on the Executive of the Association should be selected by the S.A.V.M.A.

Mr. Jackson proposed Mr. M. C. Robinson of Johannesburg. Dr. Curson seconded. Carried.

(c) **Dr. Schulz.** The Acting Secretary stated that the Acting Director of Veterinary Services had informed him that all Dr. Schulz's medical, hospital, and travelling expenses had been paid by the Department up to the present time. As it is believed that Dr. Schulz intends proceeding overseas for further medical attention, and as no official communication has been received from him, a Sub-Committee consisting of Dr. Curson and the Secretary was appointed to interview Dr. Schulz, and take further action if necessary.

(d) **Legal Advice S.A.V.M.A.** The Acting Secretary read a letter from Dr. Thomas (one of the Sub-Committee appointed to investigate the matter) in which he stated that he had interviewed Mr. Bresler and discussed the question with him. A legal retainer for the Association was out of the question on account of the cost, and in any case counsel has to be approached through a firm of attorneys, who in many instances would be able to deal with points of minor importance. It was agreed that Messrs. Lunnon and Tindall of Pretoria be appointed Attorneys to the Association and that they be informed of the fact.

(e) **Use of Letters after names—unqualified Registered Practitioners.** The Acting Secretary read a letter addressed to the Chairman of the Veterinary Board drawing his attention to the fact that unqualified registered practitioners in South Africa were allowed to use the letters "V.S." after their names, whereas these two letters were used to designate a degree in Veterinary Science given by the University of Toronto. No reply had as yet been received, but the Chairman pointed out that all these practitioners had been advised by the Veterinary Board that they were allowed to use these letters and that there was little likelihood that the Board would withdraw this permission.

(f) **Letter — Chairman Veterinary Board.** The Secretary stated that this had been replied to and the matter settled.

(g) **Mr. N. M. Clayton.** The Acting Secretary drew attention to the fact that Mr. Clayton had been convicted on a criminal charge and sentenced to 12 months imprisonment. The Judge's summing up, obtained through the courtesy of Mr. P. S. Snyman, was read to the Meeting.

The Acting Secretary stated that in his opinion the S.A.V.M.A. had a duty to perform to the Royal College of Veterinary Surgeons and that this Association should inform the Royal College of Veterinary Surgeons of any action it took in this matter.

Mr. Jackson was of the opinion that the Meeting had no option but to go forward to the General Meeting with a motion requesting Mr. Clayton to resign and he moved accordingly. This was seconded by Dr .Steyn and carried, and it was further agreed that the Royal College of Veterinary Surgeons be advised of this action and be sent a copy of the judge's summing up.

(h) **Clerical Assistance.** The Acting Secretary stated that Drs. Thomas and Fourie, to whom the matter had been left by the Finance Committee, had interviewed two applicants and appointed one on a basis of £1 per month temporarily from 1/11/34 until the end of the financial year. This action was approved.

(i) **Report of Committee appointed by Council re Encroachment by State Veterinarians on Private Practice.** The Acting Secretary read the Report submitted by the above Committee as follows :—

The Committee consists of Dr. Curson, Mr. Kirkpatrick, and Dr. Fourie. The Committee circularised all private practitioners. Some half-a-dozen replies were received.

Numbers one, two and three state that they did not experience any interference by State officials in their practice, although some of them find that the limitations placed on the use of the tuberculin test as far as private practitioners are concerned cause considerable financial loss to themselves.

Number four, without making specific statements, believes that Government Veterinary Officers in some urban areas could do a great deal more in encouraging private practice by refusing all work of a private nature which can be done by private practitioners.

The Committee wishes to draw attention to the fact that the Director of Veterinary Services has laid down that Government Veterinary Officers will assist farmers in cases of sporadic disease only in districts where there are no private practitioners.

Number five believes that there are cases where Government officials are in competition with private practitioners, but definite evidence of this fact was not laid before the Committee.

The Committee interviewed Dr. Quinlan, who is responsible for the admission of private animals to Onderstepoort. Dr. Quinlan states that no cases are admitted unless accompanied by a certificate from a veterinarian, except in the case of country districts where no private practitioners are stationed.

The Committee is of opinion that only cases requiring specialised treatment should be accepted at Onderstepoort and ordinary cases such as those of firing, castration, etc., should in every case be refused admittance, even though some veterinarians wish to refer them to Onderstepoort. The Committee believes that the best results will be obtained if Onderstepoort should stand to the private practitioner as specialist consultant and that this relationship would be of mutual benefit.

The Committee further feels that the arrangement which has been made that mileage be charged by Government Veterinary Officers when the work in sporadic diseases be rigidly adhered to.

Dr. Thomas proposed that the report be accepted. Dr. Steyn seconded. Carried. Dr. Curson proposed that the recommendations put forward by the Committee be sent to the Dean of the Faculty of Veterinary Science, the Director of Veterinary Services, and the officer in charge of the hospital at Onderstepoort.

3. **Correspondence — Letter from Mr. Brummer.** This was read to the Meeting by the Acting Secretary. Mr. Brummer raised the point of allowing Veterinary Services such as inoculation of horsesickness vaccine and the proposed intra-sinus treatment for the sheep nasal worm to fall into the hands of the laity.

This question was discussed at length. A sub-committee consisting of Drs. Curson, Thomas, Steyn and Mr. Jackson was appointed to draw the attention of the Secretary for Agriculture and Forestry, the Director of Veterinary Services and the Dean of the Faculty of Veterinary Science to the many difficulties confronting private veterinarians, the chief of these being free State veterinary services. Attention should be specially drawn to the fact that it is in the interests of the farmer to have his animals properly treated by a qualified veterinarian.

4. **Resolutions passed at General Meeting, 6th and 7th September, 1934.**

(a) **Resolution re Medical Congress.** It was agreed to delete the clause offering a copy of the Journal to medical members attending, and the Secretary was instructed to forward this resolution in the form of an invitation to the proper authority.

(b) **Resolutions 1, 2, and 3.** It was agreed that these be forwarded to the Director of Veterinary Services for action.

5. **Alteration of Constitution.** The Acting Secretary stated that he intended to give notice to introduce a motion at the General Meeting proposing that an alteration to the Constitution be effected, namely that an Hon. Secretary and Hon. Treasurer be appointed, the Hon. Treasurer to be **ex officio** a member of the Finance Committee. Some discussion took place on the advisability of reverting to these separate offices and it was suggested that the election of Joint Secretary-Treasurers might meet the case. This matter was left over until the General Meeting. No decision was arrived at.

6. **General** (a) **Customs Tariff Commission.** Mr. Carless stated that he had received complaints from private practitioners regarding the rather high duty of 25% charged on vaccines and sera not manufactured in South Africa. As Mr. Carless is proceeding to Port Elizabeth where the Customs Tariff Commission was sitting, he was authorised to take this matter up and try and obtain remission of duty on these products.

(b) **Letter from J. A. Maybin.** This letter was read to the Meeting. Mr. Maybin asked what his position was under Act 16/1933. Mr. Carless pointed out that there was no possibility of his becoming registered until the matter of reciprocity with the Royal College of Veterinary Surgeons had been adjusted. In the meantime, however, several veterinarians holding the R.C.V.S. diploma, although not registered, were practising in the Union and it was unlikely that they would be interfered with.

The Acting Secretary was instructed to reply to Mr. Maybin in this strain.

(c) **Journal — Free Reprints.** Dr. Thomas enquired whether in view of improved financial position the Editorial Committee should not now revert to the practice of supplying contributors with free reprints of their published articles. No decision was taken in the matter.

(d) **Papers to be read at General Meeting.** Dr. Thomas pointed out that much material was lost to the Journal on account of the fact that many members read their papers at the Congress and did not hand in the paper for publication. He suggested that papers to be read at the Congress should be handed to the Secretary a fortnight or 10 days before the Meeting.

This was left to the Editorial Committee for action.

(e) **S.A.V.C.** Dr. Curson mentioned that the position of Mr. W. S. B. Clapham, B.V.Sc., recently appointed at Roberts Heights in the South African Veterinary Corps was unsatisfactory in that no professional allowance, or allowance of any sort, was paid to him.

The Chairman pointed out that a Committee consisting of Drs. du Toit and Quinlan had been appointed some time ago to go into this question.

The Acting Secretary was asked to approach the existing Committee and to inform them that the Council wishes to know what action if any has been taken and to ask them to interview the Minister for Defence, if necessary.

(f) **Protechnical Section of Public Servants Association.** Dr. Curson pointed out that he had attended a Meeting of the Protechnical Section of the Public Servants' Association at which a resolution was carried to the effect that all professional appointments in the Government Service should be made at approximately the same grade of salary. This would mean that the veterinarian would start at a salary of £325 per annum, and that medical appointments and legal appointments would be made on the same, or a slightly lower or higher basis. He pointed out that so far as he knew neither the Medical Association, the Law Society, nor the

S.A.V.M.A. had been consulted in this matter.

Mr. Jackson pointed out that the S.A.V.M.A. had a powerful weapon in that most of its members were members of the Public Service Association and could be requested to resign from this latter body if this course was further pursued.

It was agreed that the Law Society and Medical Association be approached with a view to taking concerted action. If this was not possible, then a letter of protest be sent by the S.A.V.M.A. alone.

(g) **Abattoir — Port Elizabeth.** Dr. Curson mentioned that he had received a letter from Mr. Dykins, Abattoir Superintendent, Durban. In this he was informed that the Superintendent of the Port Elizabeth Abattoir was about to retire, and the speaker was of the opinion that propaganda should be set on foot for the purpose of creating an appointment for a veterinarian at the Port Elizabeth Abattoirs.

Mr. Carless, who was proceeding immediately to Port Elizabeth, was authorised to examine the position and see if any opening could be made.

(h) **List of Registered Veterinarians.** Dr. Curson pointed out that the Registrar of the Veterinary Board was now in a position to supply a list of veterinarians registered under Act 16/1933.

The Acting Secretary was instructed to obtain this list with a view to publishing it in the Journal.

(j) **Scale of Charges.** Dr. Curson mentioned that Mr. Cameron-Dow had written to the Veterinary Board and asked for a scale of fees to be charged by the private veterinarian with a view to uniformity of charge.

The Acting Secretary was asked to obtain the scale of fees which had been previously drawn up by the Status Committee, and to bring this to the Council for consideration at the next meeting.

The Meeting then terminated at 11.45 p.m.

List of Veterinarians registered under Act 16 of 1933.

NAME.	ADDRESS.
Amos, S. T. A., M.R.C.V.S., F.R.C.V.S.	305, Musgrave Road, Durban.
Alexander, R. A., B.Sc. (Agric.), B.V.Sc. (S.A.)	P.O. Onderstepoort.
Allchurch, W. B., B.V.Sc. (S.A.)	G.V.O., Vryburg, C.P.
Adelaar, T. F., B.V.Sc. (U.P.)	G.V.O., Rustenburg.
Bergh, M., B.V.Sc. (S.A.)	G.V.O., Box 85, De Aar.
Barnard, W. G., B.V.Sc. (U.P.)	Box 66, Umtata.
Brown, M. H. V., B.V.Sc. (U.P.)	P.O. Onderstepoort.
Bekker, J. G., B.Sc. (Agric.), B.V.Sc. (S.A.), D.V.Sc.	c/o M.O.H., Pretoria.
Barnes, W. G., M.R.C.V.S.	285, Bartle Road, Durban.
Bisschop, J. H. R., B.Sc. (Agric.), B.V.Sc. (S.A.)	P.O. Onderstepoort.
Brümmer, B. J. (Staatsexamen, Utrecht)	G.V.O., Kroonstad (P.O. Box 114).
Buck, J., M.R.C.V.S.	Box 336, Kimberley.
Bogue, J. Y., M.R.C.V.S.	389, Windermere Road, Durban.
Blomefield, L. C., B.V.Sc. (S.A.)	G.V.O., Port St. Johns.
Carless, F. J., M.R.C.V.S.	Ingestre, Mooi River, Natal.
Chalmers, James, M.R.C.V.S.	Box 877, Johannesburg.
Coles, J. D. W. A., B.V.Sc. (S.A.)	P.O. Onderstepoort.
Cooper, V., B.V.Sc. (S.A.)	G.V.O., Estcourt, Natal.
Clark, R., B.V.Sc. (S.A.)	G.V.O., (Box 71), Ermelo.
Cloete, J. H. R., B.V.Sc. (U.P.)	G.V.O., Mafeking.
Curson, H. H., M.R.C.V.S., F.R.C.V.S., Dr. Med. Vet.	P.O. Onderstepoort.
Cannon, G. T., M.R.C.V.S.	25, Empire Road, Parktown, Johannesburg.
Crowhurst, J. W., M.R.C.V.S., F.R.C.V.S.	Westminster House, 122, Longmarket St., Cape Town.
Cordy, C. H., M.R.C.V.S.	Uplands Hotel, Swartkopskloof Rail, Natal.
Canham, A. S., M.R.C.V.S., F.R.C.V.S.	C/o Dept. of Agriculture and Forestry, Pretoria.
Clapham, W. S. B., B.V.Sc.	S.A. Veterinary Corps, Roberts Heights.
Cameron-Dow, George F.	223, Long Street, Cape Town.
Dykins, W. A., M.R.C.V.S.	Municipal Abattoir, Williams Rd., Durban.
Du Toit, P. J. (Staatsexamen, Berlin, B.A., Dr. Phil., Dr. Med. Vet., D.Sc.	P.O. Onderstepoort.
De Kock, G. v. d. W., M.R.C.V.S., Dr. Med. Vet., D.Sc.	P.O. Onderstepoort.
Du Toit, R. M., B.V.Sc. (S.A.)	P.O. Onderstepoort.
Dickson, J. L., B.V.Sc. (S.A.)	G.V.O. (Box 44), Piet Retief.
De Villiers, O. T., M.R.C.V.S.	School of Agric., Stellenbosch.
Daly, L. L., B.V.Sc. (S.A.)	G.V.O. (Box 94), Barberton.
Dalling, J. T.	57, Second Street, Boksburg North.
De Villiers, S. W., M.R.C.V.S.	G.V.O., Gobabis, S.W.A.
Diesel, A. M., M.R.C.V.S.	G.V.O., Box 397, Pietermaritzburg.
Ewing, S. H., M.R.C.V.S.	G.V.O., Box 4, Maydon Wharf, Durban.
Edwards, L. T., B.V.Sc. (U.P.)	G.V.O., Louis Trichardt.
Fourie, P. J. J., M.R.C.V.S., Dr. Med Vet	P.O. Onderstepoort.
Frean, J. R., M.R.C.V.S.	School of Agric., Potchefstroom.

NAME.	ADDRESS.
Flight, C. H., B.V.Sc. (S.A.)	G.V.O., Port Shepstone, Natal.
Forrest, J., M.R.C.V.S.	Municipal Abattoirs, Maitland, C.P.
Gavin, F. C., M.R.C.V.S.	Rand Club (Box 6541), Johannesburg.
Garraway, R. S., M.R.C.V.S.	336, Skinner Street, Pretoria.
Green, W. J. B., B.V.Sc. (S.A.)	P.O. Onderstepoort.
Graf, H., B.V.Sc., B.Sc., D.V.Sc. (U.P.)	P.O. Onderstepoort.
Harber, A. F., M.R.C.V.S.	281, Moore Road, Durban (P.O. Box 1792).
Hutchinson, F., M.R.C.V.S.	Rockleigh, Hilton Road, Natal.
Hodder, A., M.R.C.V.S.	44, Commissioner St., Johannesburg.
Henning, M. W., M.R.C.V.S.	P.O. Onderstepoort.
Howie, A. M., M.R.C.V.S.	G.V.O., Box 276, East London.
Hearn, W. E.	"Kloof Kennels," Kloof Street, Capetown.
Horwitz, B. M., B.V.Sc. (S.A.)	Phoenix Buildings, Market Square, Port Elizabeth.
Hartig, E. R. (Staatsexamen, Dresden)	126, Main Road, Paarl.
Jackson, S. T., M.R.C.V.S.	G.V.O., Pietermaritzburg (P.O. Box 397).
Jackson, Cecil, B.V.Sc. (S.A.), B.Sc. (Wits.)	P.O. Onderstepoort.
Kirkpatrick, A. C., M.R.C.V.S.	Municipal Abattoirs (Box 1620), Johannesb.
Kind, G. G. (Staatsexamen, Switzerland), Dr. Med. Vet.	123, Rosebank Rd., Rosebank, Johannesburg.
Lund, A. E., B.V.Sc. (S.A.)	G.V.O., Box 205, Pietersburg.
Lyons, J. H. L., M.R.C.V.S.	International Hotel, Gardens, Capetown (Box 168).
McNeil, J., M.R.C.V.S.	Parker's Buildings, 1, Burg St., Cape Town.
Morice, J. A., B.V.Sc. (S.A.)	18, Cardigan Road, Parkwood, Johannesburg.
Morton, D. D., M.R.C.V.S.	P.O. Box 449, Pretoria.
Marais, I. P., B.V.Sc. (S.A.), B.Sc. (Agric.)	P.O. Onderstepoort.
Maré, C. E., B.Sc. (Stell.), B.V.Sc.	G.V.O., Box 145, Middelburg, Tvl.
Malherbe, W. D., B.V.Sc. (U.P.)	C/o Department of Agriculture and Forestry, Pretoria.
Meara, P. J., B.V.Sc. (U.P.)	G.V.O., Box 66, Umtata.
Mönnig, H. O., B.V.Sc. (S.A.), B.A., Dr. Phil.	P.O. Onderstepoort.
McCall, D. B. J., M.R.C.V.S.	253, Montpelier Rd., Durban.
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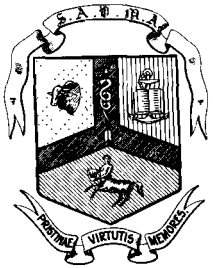
MATTERS OF VETERINARY INTEREST

1795—1881.



BY

H. H. CURSON.

DEDICATED

TO THE MEMORY OF

SIR FREDERICK SMITH, K.C.M.G., C.B., F.R.C.V.S.
(1857—1929)

WHO, NOT ONLY IN THE ARMY BUT ALSO IN RETIREMENT, LABOURED ASSIDUOUSLY FOR THE ADVANCEMENT OF THE PROFESSION.

He "was the greatest man the Army Veterinary Service has produced." *

* The words are those of Smith (p. 133) writing of W. Percivall, but are more fittingly applied to Sir Frederick himself.

Major General Sir Frederick Smith K.C.M.G., C.B., F.R.C.V.S.
P.V.O. South Africa 1903 - 1905.

For Memoir by Fred. Bullock, LL.D., see
The Early History of Veterinary Literature and its British Development,
by the late Sir Frederick Smith, Vol. IV, 1933.
Messrs. Baillière, Tindall & Cox, London.

PREFACE.

Realising that the field of research in regard to the history of the veterinary profession was a *terra incognita,* I have for many years collected information on the subject. Of approximately two dozen historical contributions, this is the first dealing with the origin of the profession in South Africa.

How many have considered the rise of our calling? How many realise that after the mining engineer the veterinary surgeon has done most for the economic development of the country? How many remember the day when, next to the policeman, the veterinary surgeon was the most hated member of the community? Is it appreciated what Duncan Hutcheon (1842—1907) did to raise the profession from obscurity to honour? Is it known that before the days of Sir Arnold Theiler there was little or no systematic veterinary research? No! Everything is taken for granted, and but few appreciate the struggles of the past.

It is a matter for pride that from the arrival of Thomas Burrowes 135 years ago, has arisen, among other bodies, the State Division of Veterinary Services, famous throughout the world for the study of animal diseases. It is amazing to consider that the extensive veterinary literature of today had its origin 80 years ago in Thacker's humble effort from Kingwilliamstown (see Fig. 7). It is therefore fit and proper to preserve the names of our pioneers with the hope that coming generations may be inspired by their example.

It is a pleasing duty to acknowledge the assistance of several helpers both in Great Britain and this country. First and foremost was the late Sir Frederick Smith, who actively perused early records and made the data available. Dr. Fred. Bullock, Col. S. L. Slocock, R.A.V.C., and Major G. E. Oxspring, R.A.V.C., have each been most helpful in providing information. I am also indebted to Officers Commanding the various Imperial cavalry regiments for details concerning their units.

In South Africa the following have rendered much assistance:— Capetown—Capt. G. Reid for the Officer Commanding, Cape Command, U.D.F., and Dr. Graham Botha; Kingwilliamstown—Dr. A. W. Burton; Durban—E. C. Chubb, Esq., and F. H. Rooke, Esq.; and Pretoria—Capt. W. S. Clapham, S.A.V.C. Dr. P. J. du Toit kindly allowed his staff to assist with the typing and photography. Dr. P. Skawran and Dr. G. de Kock perused the typescript on behalf of the Publications Committee of the University of Pretoria to which I am grateful for a grant which covers the cost of the illustrations. The co-operation of the Editorial Committee S.A.V.M.A. too is much appreciated. In conclusion, as is obvious from the bibliography, the works of Theal, Cory, Fortescue and Smith have been indispensable.

H. H. CURSON.

Onderstepoort.

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MATTERS OF VETERINARY INTEREST, 1795—1881.

(*Published with the aid of a grant from the University of Pretoria.*)

Introduction.

It is intended to summarise the leading events of veterinary importance in South Africa from the First British Occupation (1795) to the complete departmentalisation of the Army Veterinary Service (April 1st, 1881). During this period the Army contributed the larger share towards professional advancement, the civil authorities not employing a veterinary surgeon until 1873, when James Winter was appointed a member of the Natal Redwater Commission.

It is therefore inevitable that the military aspect should be stressed, but several matters of civil interest receive attention in Chapter V.

Apart from a note published by Curson (1931) giving the *names* of the military pioneers of the profession, no history has been written of the Army Veterinary Service during its stay in South Africa from 1799—1914. Certain periods have received attention, *e.g.* Gudgin (1881), Duck (1888), Smith (1912—14), and Curson (1934, 1935); but considering that the Army provided the first veterinarians and the first professional organisation, it is somewhat surprising that no historical record has been compiled by those interested, either in Great Britain or in this country. Of the 45 veterinarians who were in South Africa up to March, 1881, no less than 36 were A.V.S. officers [1]. The chief object of this paper is therefore to repair this omission.

Before dealing with the Army Veterinary Service in South Africa, it should be mentioned that an outline has been published by Sir Frederick Smith (1927), particularly in regard to its development in Great Britain. This work will be freely quoted as giving a preliminary background of conditions in the United Kingdom, so that the position of the Army Veterinary Surgeon [2] in South Africa may readily be traced. Reference

[1] The non-A.V.S. veterinarians were T. B. S. Dawkins, G. Garnett, and T. H. Merrick of the Cape Mounted Riflemen (1878—1913), W. C. Branford, J. Cammack, and D. Hutcheon of the Cape Colony, and J. Winter and S. Wiltshire of Natal. An Army officer and veterinarian was Dr. G. A. Hutton, who, however, did not serve in the A.V.S.

[2] The term veterinary surgeon was coined by the Army in 1796 to distinguish the horse surgeon from the human surgeon. The word veterinarian dates back to 1646; but Columella spoke of the "veterinarius" or animal physician in B.C. 42 (Smith, 1929).

to Smith's *History of the Royal Army Veterinary Corps* will be indicated simply by the page number (*e.g.* " Smith, p. 148 ").

This author states that "of the first thirty-four years of Mr. Coleman's (the first Principal Veterinary Surgeon) administration we have but meagre information"; as "there was no professional periodical [3] published until 1828 " (Smith, p. 49).

In 1876 occurred a disaster when P.V.S. Collins came into office, for, apparently not appreciating the records of his predecessors, he caused them to be burned (Smith, p. 2).

Thanks, however, to professional literature and to other records, sources of which will be duly acknowledged, it is possible to compile a narrative of fair detail.

CHAPTER I.

Position in Great Britain.

(a) In Pre-Veterinary Days *i.e.* up to 1796. (b) Creation of Army Veterinary Service. (c) Title of Service. (d) Heads of Service. (e) Headquarters of Service. (f) The Army Veterinary Surgeon. (g) Improvement in Position. (h) Regulations. (i) Introduction of Records. (j) Horses. (k) Cavalry Regiments sent to South Africa (Table I). (l) Conclusion.

(a) In Pre-Veterinary Days, i.e. up to 1796. [4]

As will be noted in Table I a few cavalry regiments were at Cape Town [5] before the appointment of veterinary surgeons. It is therefore necessary to consider the arrangements made for the care of horses in pre-veterinary days.

According to the *Rules and Regulations of the Cavalry,* first published on October 1st, 1795, the Quartermaster was the principal non-commissioned officer of each troop and was responsible for "everything relative to the horses," *e.g.* stables ,management, shoeing, etc. He was, in fact, the equivalent of the Regimental Horse Master, first officially sanctioned during the Great War ! Next to the Quartermaster was the Farrier Major, ranking as a sergeant and whose post had existed long before, but whose official existence dated from 1852 [6].

(3) *The Veterinarian,* first editor W. Percivall, and *The Hippiatrist,* co-editors Bracy Clark and F. C. Cherry were established in this year.

(4) By "veterinary," college-trained men are meant. Actually the first Army Veterinary Surgeon was Wm. Stockley, appointed in 1795 (Smith, p. 37).

(5) The 28th Light Dragoons arrived at the Cape of Good Hope in July 1796, and left in November 1798 and January 1799. The 25th and 27th Light Dragoons, bound for India, were detained at the Cape for a few weeks in the spring of 1796, at the time the Dutch Admiral Lucas threatened the British occupation.

(6) In 1881 the rank of Farrier Quartermaster Sergeant was substituted.

He was " to make himself intimately acqainted with the Standing Orders of the Regiment, as far as relates to the stable duty, Farriers, etc., and attend punctually to their execution." He was " to direct the Farriers in the treatment of every horse and . . . . . constantly to inspect the shoeing " (Smith, p. 18). A system of shoeing was laid down, but as cavalry regiments were more or less the property of their colonels until 1871, shoeing no doubt differed in various units.

Apart from the duties of the Quartermaster, Farrier Major, and Farrier, it is learned from *The Discipline of the Light Horse* by Capt. Hinde, published in 1778 (and quoted by Smith, p. 8), that an officer should "acquire a knowledge of the diseases to which horses are liable and the medicines proper to be employed." The surgeon, obviously, should have been of the greatest assistance.

Parry, D. H. (p. 19), quotes Lt.-Col. Dalrymple of the King's Own Dragoons as speaking disparagingly of them (the farriers) as a class, and indeed, he adds, "the veterinary surgery of those days was little else than rule-of-thumb barbarity."

(b) Creation of Army Veterinary Service.

Just as the establishment of the (Royal) Veterinary College, London, in 1791 was the outcome of the French Revolution, so was the creation of the Army Veterinary Service a result of the provision made for veterinary education by the French refugee Vial Sainbel (1750—1793), a graduate of the Veterinary School of Lyons.

The mortality among Army horses having been excessive, especially in the campaign terminating in Holland in 1795, a Board of Cavalry Officers recommended in April, 1796, the employment of veterinary surgeons in the Army (Smith, p. 39).

" This was the beginning of the Army Veterinary Service " (Smith, 1929). The founder, however, was not Sainbel (for he had died); but Edward Coleman, his successor.

(c) Title of Service.

Up to 1859 when Wilkinson became P.V.S. of the Army, there had been one veterinary service for the Cavalry and another for the Ordnance [7].

From 1796 to 1816 Coleman was the nominal head of both, but thereafter, and until 1859, there had even been separate chiefs.

Up to 1859 " there was no page in the Army List showing collectively the officers of the Veterinary Service, but in that year a page appeared headed Veterinary Medical Department" (Smith, p. 157). Further, "as

[7] The first veterinary surgeon to be appointed to the Royal Horse Artillery was in 1861, former artillery veterinary surgeons having attended to the horses of the Royal Field Artillery (Smith, p. 57).

late as July, 1860, all probationary veterinary officers were gazetted under the heading Veterinary Medical Department" (Smith, p. 66).

In January, 1861, the word medical was omitted [8] and the designation became Veterinary Department; but real departmentalisation, which commenced in 1878, was not complete until 1881.

(d) Heads of Service.

In 1796 Principal E. Coleman (1765—1839) of the Veterinary College, London, was appointed Medical Superintendent to the Veterinary Service of the Board of Ordnance (Artillery) and Principal Veterinary Surgeon of the Cavalry. In 1816 John Percivall (1768—1830), became the Senior Veterinary Surgeon of the Artillery, Coleman, however, retaining his position in the Cavalry until his death in 1839. F. Cherry (1779—1854) followed Coleman and was in turn succeeded in 1854 by J. Wilkinson (1804—1876).

In the meantime the senior veterinary surgeons of the Artillery were Percivall and W. Stockley (1776—1860) who, following Percivall in 1830, retired in 1858.

Wilkinson, who had become P.V.S. Cavalry in 1854, also took veterinary charge of the Artillery in 1859 and was thus the first P.V.S. of the Army. He died in 1876 and was succeeded by James Collins (1830—1895), who retired in 1883.

Portraits of Coleman and Collins are to be seen in Smith's *History of the R.A.V.C.*

(e) Headquarters of the Service.

This was the Royal Horse Infirmary, Woolwich (where P.V.S. Wilkinson also had his own quarters), until 1876, when P.V.S. Collins moved to the War Office, Pall Mall, having succeeded in getting the "Department" recognised as part of the War Office [9]. "The home of the Department" nevertheless was Woolwich until 1880, when the Army Veterinary School was opened at Aldershot (Todd, 1927).

(f) The Army Veterinary Surgeon.

The candidate having passed a professional examination—after a three months' academic course [10]—conducted almost entirely by medical

(8) The word medical is still retained in the obsolete title Veterinary ation.

(9) In 1912 the Record Office was moved from the War Office, London, back to Woolwich, where it still is.

(10) According to a letter published in the *Veterinarian* in 1834, p. 330, "Studens" states that "the law brought in force some few years since . . . says that a student shall not present himself for examination until he has studied *twelve months* at the College." This was generally evaded and apparently no attempt was made to enforce attendance (letter of 15/6/34 from Dr. F. Bullock). In 1873 the course was extended to 2 years, in 1876 to 3 years, in 1895 to 4 years and in 1932 to 5 years. In 1831 Utrecht had a four year course (*Veterinarian*, September, 1831).

men until 1844—was then eligible for the Army. He first had to satisfy Coleman (or the Senior Veterinary Surgeon of the Ordnance—Smith, p. 146) as to his fitness, unless presumably he had been seconded by his regiment for veterinary studies at Camden Town [11].

Having satisfied Coleman, his application would be forwarded, presumably along with others, to the colonel of a cavalry regiment. The

Fig. 1.

Uniform of Veterinary Surgeon, 8th Hussars, 1823.

(Thomas Burrowes was V.S. during 1799—1803.)

According to the coloured illustration shown in Smith's *History of the R.A.V.C.* (p. 72) the *head-dress* was a black cocked hat "worn fore and aft". The *coat* (unlike in other branches of the Cavalry) was not regimental, being blue and long-tailed "with cuffs and collar of regimental pattern; both these and the 'turn-back' of the tails were of the same colour as the regimental facings. The tails of the coat were ornamented with the regimental badge . . . .". The *overalls* above were red, but "for ordinary occasions" they were blue-grey. In all branches of Cavalry the *sword, belts,* and *overalls* were of regimental pattern.

The earliest Dress Regulations available were published in 1822.

(11) It is significant that from 1823, when Dick's Veterinary College at Edinburgh was established, until Coleman's death in 1839, no Scottish graduate succeeded in passing Coleman's test (Smith, p. 94).

colonel would make his recommendation (Smith, p. 114) and the Commander-in-Chief would then grant approval. It is significant that although the class of veterinary surgeon was often represented to be inferior, yet in confidential reports (Smith, p. 67) "they are generally described as good" men.

Upon entering the Army he was entitled acting veterinary surgeon while on probation, and after appointment generally wore the uniform of his regiment [12] until the departmentalisation of the service in 1881. Although called veterinary surgeon as late as 1891, he was sometimes officially referred to as a veterinary *officer* (—1859—Smith, p. 148) or even as a *medical* officer (—1846—Smith, p. 65).

The position in regard to military rank is referred to in the next section.

After Coleman's death, a Board, of which the P.V.S. was President, examined candidates for the Army (Smith, p. 115).

"The cost of preparing a commission . . . . in 1796 was £5 0s. 6d.; by 1830 the charge had fallen to 30/-" (Smith, p. 45).

The veterinary surgeon (in 1853) "continued to furnish and maintain his pocket case of instruments" (Smith, pp. 126 and 167), and veterinary arrangements were at the same period "of a very primitive kind, the . . . equipment for a regiment of cavalry" consisting "of two regimental chests . . . and two troop chests. The former contained all the drugs and surgical appliances allowed" and the latter only an assortment of compounded medicines (Smith, p. 135). Up to 1832, P.V.S. Coleman had the contract (*3/- p.a.* per horse) for the supply of drugs, with "suitable clothing for horses when sick, bandages, . . . tow . . . kettles, . . . fuel, . . . bleeding cans, . . . instruments; and means of casting horses with safety . . ." (*The Hippiatrist,* Aug. 1st, 1830, quoted by the *Veterinarian,* June, 1831 (p. 396).

(g) Improvement in Position.

In order to judge the improvement in position of the Army veterinary surgeon, it is essential to study the orders which were issued by the

[12] Provision was made in 1861 for the Veterinary Staff (P.V.S. and Staff V.S.) to wear the uniform of the Cavalry Depot, *i.e.* Light Dragoons, but as late as 1874 probationary V.Ss. wore "undress artillery uniform with *maroon* velvet collar and cuffs". In 1874 the Veterinary Staff uniform (now Dragoon) had facings of *maroon*. By 1883 all regimental uniform had been abolished, except in Household Cavalry, and departmental uniform substituted. See Appendix 1, Smith, p. 243.

[13] Smith refers to sick horse depots as having been improvised during the Peninsular War (p. 136) and Crimean War (p. 137); but no doubt similar arrangements were made for other campaigns. Although veterinary hospitals were formed on the lines of communication during the Abyssinian War of 1867, regulations for control were not laid down until 1878.

War Office at irregular intervals. Details are given below :—

1796—Commissions granted to veterinary surgeons of Cavalry and pay fixed at 7/- per day.

1798—Pensions granted to widows. A veterinary surgeon's widow received £20 per annum, this being £6 less than that of the assistant surgeon! The husband was to have had ten years full pay service.

1803—Veterinary surgeons of Cavalry "allowed 6d. *p. m.* travelling expenses both ways" whenever distance from headquarters to outpost exceeds 25 miles.

1805—Ordnance Veterinary Warrant—First three years of service 8/- per day, next seven years 10/- per day, next ten years 12/-, and over twenty years 15/- per day. Half pay was half the full pay. A widow received "£30 *per annum* and additional for her children."

1807—Cavalry Veterinary Warrant—By this "the cavalry veterinary surgeon obtained the same rate of pay and retiring allowance" just mentioned under 1805; and it is clear that he could "retire at 20 years service on 7/- per day and a retiring rate after 30 years service of not less than 12/- per day." His widow, however, only got £20 per year pension.

1811—"Veterinary Surgeons, no matter how long they had served, were, as an indulgence, classified as Cornets for choice of quarters only."

1812—Pensions (£50) for the loss of a limb or an eye in action were made applicable to the Veterinary Service.

1815—"For the first ten years of his service the Veterinary Surgeon is to class as a Cornet, after ten years as Lieutenant, and after twenty years service as Captain." This arrangement gave no claim to military command and was merely for the allocating of quarters.

1826—Provision (£40) made for dependants of a veterinary surgeon killed in action. This sum applied also to the assistant surgeon.

1830—A Royal Warrant gives rates for half and retired pay after various periods of service. "This warrant was no advance on that of 1807" (Smith, p. 93).

1846—A warrant applicable to the whole Army provided for "a small increase in retired pay," but "no increase in serving pay" to the veterinary surgeon (Smith, p. 119).

1857—A new scale of pensions for those wounded in action was no improvement on the warrant of 1812.

1859—The first warrant "to *grade* Veterinary Officers, by the introduction of a principle of classification intended to promote zeal and to encourage ability. The grades were Veterinary Surgeon, relative rank Lieutenant; Veterinary Surgeon, 1st class, as Captain; Staff Veterinary Surgeon as Major; but in all cases junior of that rank, excepting for choice of quarters" . . (Smith, p. 148). The Principal Veterinary Surgeon held the relative rank of Colonel, but this was not mentioned in the warrant. The rates of serving and half pay were slightly improved and promotion was "thrown open by retirement of men at a definite age." Administrative officers were first appointed.

1878—Regimental system abolished in all units but Cavalry. The warrant "was the first big step towards efficiency" (Smith, p. 166). "The new men were better paid and the Inspecting Officers were both better paid and received a better retiring allowance" (Smith, p. 165).

1880—Provision was made "for special promotion to the rank of 1st Class Veterinary Surgeon of Veterinary Surgeons who rendered distinguished service in the Field." Smith states (p. 169): "It was the cheapest and worst conceived scheme ever devised . . ." and "was followed by the gravest discontent" as junior officers were promoted over the heads of seniors.

1881—*Complete* departmentalisation of the Service under the designation Army Veterinary Department, only the officers of the Household Cavalry continuing to be regimental.
It was not until the early eighties that the officers of the Veterinary Service were eligible for Good Service Rewards [14], Honours for Active Service [15] and for Presentations at Court [16] (Smith, p. 175 and p. 176; *Vet. Journal,* XLII, p. 394, 1896).

The Departmental badge and button were not adopted until 1891 and 1894 respectively (see footnote 12).

(h) Regulations.

1795—*Rules and Regulations for the Cavalry.* They contain "very full information . . . . regarding the farriery department" (Smith, p. 17).

(14) Gudgin being the first recipient in 1880.

(15) P.V.S. J. J. Meyrick received a C.B. (Military Division) after the Egpytian Campaign in 1882.

(16) In 1850 V.S. Cullimore, Bengal Horse Artillery, was presented at Court. Professor Sewell of the Royal Veterinary College, London, had already been presented as Veterinary Surgeon of Volunteer Light Horse. In 1883 Collins succeeded in removing the restrictions against presentation at Court and was the first veterinary surgeon presented.

1796—*Instruction for the Use of Farriers attached to the Cavalry and to the Honourable Board of Ordnance.* These were drawn up by P.V.S. Coleman and issued with a chest of medicines to each unit. A second edition appeared in 1803.

1813—*Regulations on the Transport of Horses by Sea.* These were the first military instructions on the subject.

1824—*Directions for the Farriers of the Royal Artillery.* These were compiled by John Percivall, Senior Veterinary Surgeon to the Ordnance.

1847—*Regulations for the Performance of Veterinary Duties.* Smith (p. 122) states that these "directed the examination of all remounts" on joining. He adds, "This is the first mention of Veterinary Regulations I have met with."

1853—*Regulations for the Performance of Veterinary Duties.* These were compiled by P.V.S. Cherry and issued in 1853 to the Cavalry and in 1856 to the Artillery. Smith (p. 126) states that the "nomenclature of diseases" was very logical and arranged in 16 classes [17] and that "In the appendices . . . is a form of requisition for medicines identical with that still in use." Another edition appeared in 1872.

1866—*Regulations for the Supply of Military Stores to an Army in the Field.* These "set forth the veterinary organisation (for the first time) for an army consisting of 15,000 fighting men of all arms," for which "10,000 hired transport animals were required." Smith (p. 155) states that the "scheme was infinitely superior to the arrangements" made for the Second Anglo-Boer War.

1876—*The Organisation and Composition of an Army Corps.* This "was the first time that any effort had been made to organise the Army for War" (Smith, p. 158).

1878—*Regulations for the Organisation of the Lines of Communication of an Army in the Field.* In this scheme an effort was made to obtain farriers as a subordinate staff. Among other details "the charge of an executive officer was 250 animals, while there was to be an administrative officer for every 3,000" (Smith, p. 166), as compared with one veterinary officer for 400 animals in P.V.S. Wilkinson's scheme of 1866, when the subordinate staff was civilian.

1881—*Regulations for the Supply of Stores in the Field.* Provision was made for a veterinary depot of stores, but as in 1866 it was supervised by a veterinary surgeon attached to the Ordnance Store Department (Smith, p. 167).

[17] An official "nomenclature of diseases" was available in 1818 for the preparation of the half yearly return (Smith, p. 95).

(i) Introduction of Records.

1802—Register of sick and lame horses: Ordnance.

1812—Casting return.

1818—Register for sick and lame horses: Cavalry.

1818—Half yearly return of sick and lame horses to be sent to the War Office.

1822—A copy of the half yearly return of sick to be forwarded direct to the Veterinary Surgeon General [18].

1839—A record of treatment, including post mortem examinations.

1853—As seen under the regulations of 1853 a form of requisition for medicines was provided.

1872—Death report shewn in Smith, p. 24.

1880—Veterinary History Sheets. See *Journal of the Royal Army Veterinary Corps* III (2), p. 64.

In 1877 the first Veterinary Statistical Report on the horses of the Army was issued by the P.V.S., but as far back as 1838 "precise statistics (the first) of the health of Army Horses had been published" (*Veterinarian,* June, 1838). Smith mentions (p. 106) that the "mortality (in a regiment of heavy cavalry from 1830—37) was 2.8% and the castings 8.3%. The chief cause of death was pulmonary trouble".

No mention of records would be complete without a reference to V.S. Gloag's (10th Hussars) essay "Hints to Veterinary Surgeons entering the Army, regarding their Conduct, Duties, etc." read on the 20th May, 1839, before the Veterinary Medical Association of the London Royal Veterinary College, and published in the *Veterinarian* of the same year (XII, pp. 276—314). It is clear that daily and weekly reports were also in use at that period. See also Smith's (1927) paper "Fifty Years Ago," appearing in *Vet. Jl.* LXXXIII, describing the Veterinary Service when he joined in 1876.

(j) Horses.

With regard to the purchasing of horses, each cavalry regiment remounted itself until 1887 (letter of 14/6/34 from War Office to Dr. F. Bullock), when the Remount Department was created. The veterinary surgeon was naturally responsible for the soundness of the horses purchased, a fact emphasised by V.S. Gloag (1839) and also laid down in para. 28 of Regulations for the Performance of Veterinary Duties (Smith, p. 122). In exceptional circumstances a veterinary surgeon would even purchase the remounts for his own regiment, e.*g.* in the case of John

[18] It is significant that in official documents as far back as 1803 this designation also appears (Smith, p. 83).

Wilkinson, when veterinary surgeon of the 17th Lancers (Smith, p. 134) [19]. Horses after purchase were numbered by cutting "in the hair" (—1804—Smith, p. 17). Branding on the hoof was employed as

Fig. 2.

Uniform of Veterinary Surgeon, 12th Lancers, 1846.

(James Thacker was V.S. during 1851—53.)

Smith (1927, p. 120) shows the upper part of the *lance cap* as red, but the states (p. 247) "it has been suggested that it (lance cap) should be all black, but the regulations give us no such instruction, they merely stipulate that for the regimental staff (which included the V.S.) the cap is to be without gold ornaments". As will be observed in Fig. 6, the 12th Lancers *en route* to Basutoland in 1852 "are in undress with white cap covers" (Tylden). The *uniform* above is dark blue with red facings and the *overalls* (also dark blue) have a yellow stripe.

far back as 1795, but tattooing was introduced (by Sir Frederick Smith) only during the Second Anglo-Boer War.

[19] So great, however, was the influence of a colonel in the early days that when a veterinary surgeon (Johnston, G., of the 6th Dragoon Guards), in 1847, dared to reject 7 of 19 horses, presumably purchased by the colonel, he was reprimanded, being informed "that he was not answerable for the soundness or unsoundness of horses when purchased, and that his duties were confined solely to veterinary practice" (Smith, p. 123). This was, of course, official nonsense!

It was not until the end of the 18th century that military stables were constructed. These were badly ventilated and, as in the case of private stables, were most unhygienic. As might be expected, glanders, strangles, and other respiratory affections flourished under such conditions and Coleman's best work was the lowering of mortality by the introduction of hygienic measures, such as better ventilation and use of disinfectants.

A century ago a regiment would be split up into numerous detachments and the dragoons with their horses were billetted on the populace. During the summer horses would be " turned out to grass " and " the money thus saved, technically known as ' grass money,' went to the purchase of necessaries for the Dragoon" (Smith, p. 17). The importance of reliable farriers in such circumstances can be appreciated.

Smith (p. 127) mentions that " the cavalry were greatly concerned at the notion of putting their horses in the open during autumn at Chobham " Camp in 1853. " Tented stables were accordingly " provided [20].

According to Smith (p. 108) the veterinary surgeon had to pay for the forage for his chargers as long as the regimental system lasted, although in all other arms it was free. Remarkable to relate it was the colonel who provided forage on a contract system.

Until railways became available the movement of sick horses was most unsatisfactory. If able to walk " they were led along with the baggage " (Smith, 1929, p. 65); if too ill they were left with farmers or destroyed. Each regiment cared for its own sick and the attendants, except for the veterinary surgeon, were untrained men.

For active or garrison service overseas the transport of horses was well understood [21]. As far back as 1813 regulations dealing with the transport of horses by sea had been issued, but it was not until 1848 that a veterinary surgeon described (*Vet. Record* IV, 1848, p. 101) the professional aspect of transport in the days of sailing ships. This writer, V.S. Mellows, accompanied his regiment (1st Dragoon Guards) to Canada, the casualties being 11%, but on the return journey this percentage was reduced to 5% (Smith, p. 124).

With regard to shoeing, as mentioned before, a system had been laid down in 1795, but no doubt colonels of regiments introduced their own ideas. In 1853, through the efforts of P.V.S. Cherry, a Board

[20] A few months later the horses were exposed to the severity of a bitter winter on the heights of Balaclava (Smith, p. 127).

[21] As an example of the frequent movement of troops last century may be mentioned the 17th Light Dragoons. This regiment celebrated the birthday of King George III (4th June) in the following places: 1806, Canterbury; 1807, Monte Video; 1808, Cape Town; and 1809, Surat (Parry, p. 170).

TABLE I.

Units and their Veterinary Surgeons, South Africa, 1795—March, 1881.

Units. (Those printed in **black** type brought horses.)	Arrived from.	Period in South Africa. 1795—1803.	Period in South Africa. 1806—1881.	Proceeded to	Veterinary Surgeon.	Further Remarks.
25th Light Dragoons	Great Britain.	1796	—	India.	—	Re-numbered 22nd L. D. in 1802, disbanded in 1818.
27th Light Dragoons	Great Britain.	1796	—	India.	—	Re-numbered 24th L. D. in 1802, disbanded 1818.
28th Light Dragoons	Great Britain.	1796—99	—	India.	—	Disbanded in 1802.
Cape Mounted Riflemen	—	—	1827—70	—	1840—60, J. Kingsley. 1861—70, T. Paton. 1862—69, F. F. Marshall.	Disbanded in 1870.
1st Dragoon Guards	Great Britain.	—	1879—81	India.	S. Longhurst. R. Moore.	—
7th Dragoon Guards	Great Britain.	—	1843—48	Great Britain.	B. C. R. Gardiner.	—
6th Dragoons	Great Britain.	—	Feb. 1881	Great Britain.	J. Findlay.	Left Natal 1890.
7th Hussars	Great Britain.	—	Apr. 1881	Great Britain.	A. A. Jones.	Left Natal 1882.
8th Hussars	Great Britain.	1796—1803	—	India.	1799—1802 or 03, T. Burrowes.	In 1796 were Light Dragoons.
12th Lancers	Great Britain.	—	1851—53	India.	J. Thacker.	—
14th Hussars	India.	—	Mar. 1881	India.	D. C. Pallin.	Left Natal, Nov., 1881.
15th Hussars	India.	—	Jan. 1881	Great Britain.	C. W. Gillard.	Left Natal, Nov., 1881.
17th Lancers	Great Britain.	—	1879	India.	J. D. Lambert.	—
20th Light Dragoons (22)	Great Britain.	—	1806	South America.	W. Hargrave.	—
21st Light Dragoons (22)	Great Britain.	—	1806—17	India.	1806—12. W. Levett. 1813—17. J. Schroder.	—
Royal Artillery (23)	Great Britain.	—	1878—79	—	F. Duck, B. L. Glover.	—
Army Veterinary Department	Great Britain.	—	1879—80	—	T. P. Gudgin, W. Burt, G. H. Fenton, W. R. Hagger, M. F. Healy, T. A. Killick, J. W. A. Morgan, C. Phillips, F. Raymond, W. B. Walters, W. Gladstone and J. G. R. Rayment. There was no Army V.S. in the country at the end of 1880.	—
Army Veterinary Department	Great Britain.		1881	—	J. D. Lambert, F. Duck, J. Reilly, G. Durrant, W. D. Sartin, W. Pallin, C. Rutherford, and T. Caldecott. The above were probably all in S. Africa by 31/3/81.	—

(22) Although the 20th **Hussars** (now 14th/20th) and 21st Lancers (now 17th/21st) bear the same numbers, their predecessors (20th and 21st Light Dragoons respectively) were actually disbanded and ceased to exist.

(23) V.S. Duck and V.S. **Glover** were seconded for service in the Ninth Kaffir War (1877—78), but when departmentalisation was introduced (22/4/78) they naturally fell under the P.V.S., A.V.D.

recommended a uniform pattern of shoe for the Cavalry. This type, flat on the ground, seated on the foot surface, stamped, and without fuller, lasted as a service pattern from 1853 to 1882 (Smith, p. 126).

Until the wars in South Africa (1879, 1884) demonstrated the inefficiency of Army shoeing, farriers held until 1888 a contract for shoeing at ½d. *p. d.* for each effective horse (Smith, pp. 14 and 179).

An important article, "Practical Observations relative to Stable Duties and the General Care of Horses" by V.S. Castley (12th Lancers), giving an idea of stable management a century ago should be studied (*Veterinarian* IV, June, 1831, pp. 301—307).

(k) Cavalry Regiments sent to South Africa.

In the accompanying Table I, not only are details given concerning the cavalry regiments, but also with regard to the Cape Mounted Riflemen (a unit controlled by the Imperial Government), the Royal Artillery, and, of course, the Army Veterinary Department.

It must be emphasised that at times only part of a regiment might be present, *e.g.* the main part of the 1st D.G. departed in October, 1880, for India, but a detachment, left in Maritzburg, served in the First Anglo-Boer War. Again, a regiment might bring only a part of the horses required, *e.g.* 20th Light Dragoons in 1806.

As the 7th Hussars arrived in April 1881, *i.e.*, after the period covered by the Table, there is no need to include the regiment, but it is shown for convenience.

(l) Conclusion.

At the commencement of the period under review, we see the replacement of uneducated farriers by trained veterinary surgeons. Consequently in place of bleeding, purging, and blistering as routine methods of treatment, even for communicable diseases, *e.g.* glanders and strangles, the principles of preventive medicine, *e.g.* ventilation and disinfection, were gradually introduced with good results.

At the same time, through colonial expansion, the Army Veterinary Service was called upon to supply the pioneers of the profession to South Africa. Table I gives a list of the Cavalry regiments despatched to South Africa up to 1881.

Commencing in an exceedingly humble position, the military veterinary surgeon, not only by his own efforts, but through the endeavours of able administrators, *e.g.* Cherry and Collins, obtained step by step the status of his medical and combatant colleagues.

It is evident that the regimental system was disadvantageous from a professional aspect. Not only was the best use not made of the veterinary surgeon especially on a campaign, but his initiative was limited, and he had not the benefit of discussion with his professional colleagues. As Smith (p. 154) remarks, the "influence of regimental organisation" was deadening.

CHAPTER II.

Position in Cape Colony, 1795—1803.[24]

(a) Introduction. (b) First Occupation of the Cape, 1795—1803. (c) Campaigns in South Africa, 1795—1881 (Table II). **(d) Thomas Burrowes. (e) Conclusion.**

(a) Introduction.

Having traced the development of the Army Veterinary Service in Great Britain, it is possible now to describe conditions in South Africa, where the first military veterinary surgeon, Thomas Burrowes, arrived in 1799, to join his regiment, the 8th Light Dragoons [25].

As every schoolboy knows, the occupation of the Cape of Good Hope in 1795 was merely an incident in the prolonged Franco-British struggle of 1793—1815. The French, who had overrun the Netherlands, having forced the Prince of Orange to seek refuge in England and, in April, 1795, having expelled his British allies, concluded the following month an alliance with the Dutch, who in the meantime had adopted a republican form of government. The British Government, with the experience of fourteen years before, when the French Admiral Suffren occupied the Cape, wisely decided on this occasion upon the exclusion of the French, especially as a large proportion of the inhabitants were, as General James Craig later said, " infested with the rankest poison of Jacobinism " (Fortescue, IV, p. 396).

It is in connection with the subsequent garrisoning of the Cape of Good Hope, during both the First (1795—1803) and Second Occupations (1806 onwards), that veterinary surgeons were stationed with their regiments and when necessary accompanied them during the several campaigns. See Table II.

(24) Incorporating " Some Pioneers of the Veterinary Profession in South Africa " by the author, and published in *Jl. R.A.V.C.* II (2) Feb., 1931.

(25) Private letter dated 11/1/28 from Sir Frederick Smith who, however, acknowledges assistance from Col. A. G. Todd and Major H. Kirby, R.A.V.C.

Thanks to Mr. Werner Schmidt of Pretoria it is possible to record who was apparently the first " veterinary practitioner " at the Cape, *viz.* Matthaeus Graef, a blacksmith who prepared plasters and other remedies from Cape herbs for external maladies of horses. According to Peter Kolb's work, *Caput Bonae Spei Hodiernum,* p. 326 (Nürnberg, 1719), Graef not only experimented on his slaves but also kept his secrets from his sons and daughters.

Graef, although uneducated, was an intelligent man and an excellent citizen. He came from Pomerania and on 12th November, 1684, married Susanna Klaasen, at the Cape, where he had become a free burgher. Eight years later he came into possession of Nooitgedacht, a farm near Stellenbosch (see Fairbridge, D., (1922) *Historic Houses of South Africa,* p. 124, Maskew Miller & Co.).

For further details see Schmidt's *Die Duitsers aan die Kaap — Individueel en as kultuurgroep behandel.* MS. p. 121. In preparation.

It has been suggested to the author that, prior to 1795, there were veterinary surgeons with the Dutch dragoons, but, as the Utrecht Veterinary School was not established until 1821, it is hardly likely that such was the case.

European South Africa, or better still, the Cape of Good Hope, at the time of the First British Occupation, consisted of the districts of Cape, Stellenbosch, Swellendam, and Graaff-Reinet. Politically the Cape and Stellenbosch were settled and peaceful, Swellendam was discontented, and Graaff-Reinet was in open rebellion. The eastern frontier was the Fish River, but Xosa tribes were firmly established west of this boundary, in the present districts of Albany, Bathurst, and Alexandria.

The settlement in Cape Town, which had been developed by the Dutch East India Company [26], was 143 years old, and the Huguenots had been in the country for 107 years.

The European population of the Colony was approximately 20,000, of which roughly one-quarter resided at Capetown. Slavery existed, there being about an equal number of slaves and Europeans. Except for the Lutheran congregation in Capetown the people were predominantly of the Dutch Reformed faith.

While attempts had been made to improve sheep and horses, there was no government organisation for the administration of agricultural and livestock problems, although these formed the mainstay of the country. There was no official gazette and no state control of postal affairs. Capetown, although a recognised port of call for well-nigh one and a half centuries, had not the comforts and conveniences of a modern village. There was no library, no public school, no theatre, and no printing press. On the other hand life must indeed have been pleasant for the colonist; for not only was he an aristocrat, but competition was not keen, the climate was temperate and the land fertile. The farming community, although familiar with scab in sheep and goats, *lamsiekte*, and *stywesiekte* in cattle, and glanders in equines, had not experienced the frequent devastating epizootics of later years, horse-sickness being only an occasional scourge, *e.g.* in 1780. Overstocking, that great curse of the 20th century, with its attendant evils, was not possible owing to unlimited grazing. There was no freedom of Government or trade, and civil servants were a privileged class. Finally the Native "question" had already made itself manifest, for the Bushmen were hostile and caused much trouble; but the Hottentots, being easy-going, were content to live in "a kind of symbiosis", with the Europeans [27].

[26] This famous trading organisation became bankrupt in 1791.—Bleby, A. S. (1911) *South Africa and the British Empire*, p. 75. J. C. Juta & Co.

[27] In fact Hottentot soldiers (Pandours) were employed by the D.E.I.C. — See Cory, G. E. (1910), p. 89.

The Bantu tribes, however, resenting the spread of colonists in what is today the Eastern Province, had on two occasions, First Kaffir War (1779—81) and Second Kaffir War (1793), clashed with the Europeans.

While it is not until the early fifties that the *direct* influence of our profession can be traced, it is proposed to refer in chronological order to the veterinary aspect of conditions at the Cape from 1795. To do this, frequent reference will be made to the cavalry regiments, although the Kaffir wars (Third to Ninth), Zulu War, and Transvaal War, in which they participated, have been described separately [28].

(b) First Occupation of the Cape, 1795-1803.

When General James Craig, who had been Chief of the Duke of York's Staff in 1794, arrived with his force of 500 men off the Cape of Good Hope on June 10th, 1795, he was met by a naval squadron under Admiral Elphinstone. Two days later the entire fleet anchored in Simons Bay. For a fortnight the relations between the British and Dutch authorities although stiff were not hostile, but it was obvious that matters could not remain thus for long. On June 27th the Commissioner Sluysken, tiring of his unwelcome visitors, " refused to supply more fresh provisions to the British, and drove in all the cattle from the country . . . ., so as to ensure that the invaders should take no fresh meat for themselves " (Fortescue, IV, p. 397).

Craig thereupon occupied Simonstown and with the arrival of reinforcements under General Clarke on 3rd September formed a stores depôt at Muizenberg, attacked the Dutch at Wynberg, and on September 16th the combined naval and military forces took possession of Capetown.

This undertaking is unique in that Craig landed and transported all stores without the aid of a single vehicle or animal. Everything had to be carried by the troops and seamen and, although the line of communications was probably only 15 or so miles, yet owing to the deep sand and a vigilant foe the operations proved very trying.

The first cavalry regiment to arrive at the Cape was the 28th Light Dragoons, which accompanied other reinforcements from Great Britain during the second quarter of 1796. When the British authorities learned that the Dutch (Batavian Republic) Government, established in 1795, hoped to recapture the Cape and that a fleet under Admiral Lucas had been despatched in February, 1796, not only were troops sent to South Africa, as just mentioned, but regiments " destined for India were landed from the transports in Simon's Bay, and every exertion was made to mount the dragoons " (Theal, V, p. 14). The dragoons were men of the 25th and 27th Light Dragoons who, arriving in August, 1796, only remained a few weeks before proceeding to their destination.

[28] For Zulu War see *Vet. Rec.*, Jan. 5, 1925; for Transvaal Wars see *Vet. Jl.* Vol. 90, Feb., 1934; Kaffir Wars (in preparation).

Admiral Lucas voyaged south in such a leisurely manner that the convoy transporting the 28th Light Dragoons (400 strong) actually passed in sight of the main Dutch fleet while at anchor off the Canary Islands, during the middle of April. Eventually when Lucas reached Saldanha Bay early in August, he was compelled to surrender by Elphinstone and Craig. The former had brought a powerful naval squadron from Simon's Bay and the latter had marched with a force of 2,500 men, including detachments of the 25th and 28th Light Dragoons. Fortescue (IV, p. 508) describes Craig's journey as "the first real march ever made by British troops in South Africa, a dreary tramp of 90 miles through so barren a country that but five houses were seen in the whole of it . . . . The men suffered every privation except that of meat and the column took nine days to reach Saldanha Bay."

It is evident that horses did not accompany the 28th Light Dragoons (letter dated 30/7/1796 from General Craig to Rt. Hon. Henry Dundas —Theal, 1897-99, Vol. I, p. 418), and it is clear that horses were not available for the 25th and 27th Light Dragoons (each 400 strong), for Theal (V, p. 14) states, "All the saddle horses in the town and neighbourhood were required to be brought in by their owners, but were paid for on a valuation made by two dragoon officers and two members of the Court of Justice. Waggons for transport were also pressed into service, but without being purchased." Fortescue adds (IV, p. 508), "the burghers with surprising readiness helped Craig to impress waggons and cattle, as well as horses and saddles for the cavalry."

Chichester and Burges-Short (1899) state (p. 140) that the 29th Light Dragoons (1794—1802), later 25th Light Dragoons (1802—1818) served at the Cape, but this cannot be confirmed. The 25th L.D. (1794—1802) at the Cape in 1796 became later the 22nd L.D. (1802—1819).

A century ago it took a small fleet to move a cavalry regiment by sea, and Sir Frederick Smith mentions in a private letter (dated 11/1/28) that on one occasion "it took 12 ships to carry 424 horses and there were only two spare stalls allowed on each vessel."

The 28th Light Dragoons which left the Cape in November, 1798, and January, 1799, for India, was joined in November, 1796, by the 8th Light Dragoons, which "in the spring of 1796 . . . . received orders to march from Manchester . . . to Coventry for embarkation to the East Indies. There, they got rid of their horses and marched on foot to Portsmouth. They embarked 488 strong, divided into six troops. Two days before sailing the destination of the Regiment was altered to the Cape of Good Hope . . . They arrived at the Cape on November 10th, having lost only one man by sickness during the voyage of over 90 days. Aug. 11th—Nov. 10th.) They were mounted and moved to 'Rondybosh' Camp where they were inspected in January, 1797". (From letter dated 31/5/34 from Adjutant, 8th Hussars.) The 8th Light

Dragoons, still existing as the 8th (King's Royal Irish) Hussars, is of particular interest to the veterinary profession in that the first veterinary surgeon stationed in South Africa, Thomas Burrowes, was appointed to this unit [29].

It is interesting to learn (Theal, 1897—99, Vol. I, pp. 489—493) that General Craig in writing on 20th November, 1796, to the Rt. Hon. Henry Dundas reported that the difficulty in regard to the 8th Light Dragoons was not to mount them "but that from feeding their horses when mounted." He goes on to say that the harvest had been "a very bad one". By Proclamation of December 2nd, 1796, we learn that the 8th Light Dragoons and 28th Light Dragoons had then been mounted, for Craig thereby made provision for the supply of barley for the cavalry.

The remaining regiments of Light Dragoons were disbanded as shown in Table I.

It will be observed from Table I that cavalry regiments stationed at the Cape frequently proceeded to India to complete their tour of "foreign" service. This was undoubtedly arranged in order to acclimatise the men and possibly their horses, although horsing was often undertaken in India, being sometimes well carried uit (*e.g.* 17th Lancers in 1809 on Persians) and at other times an unsatisfactory matter (*e.g.* 17th Lancers in 1857—"Arab stallions, Australian Walers, a few Cape mares, and a varied assortment of long-tailed, long-maned nondescripts" being available. — Parry, D. H., pp. 171 and 229).

Apart from the purely garrison duties performed by the cavalry, detachments were scattered throughout the Colony for police purposes, *e.g.* Stellenbosch, Swellendam and Graaff-Reinet. "Quartering dragoons upon offenders holding Jacobin principles was the ordinary method with Lord Macartney of bringing them to reason. There was a scale of diet" provided for the dragoons in such cases (Theal, V, p. 28). The value of reliable farriers in such circumstances can readily be appreciated.

On the evening of 22nd November, 1798, occurred at Capetown the loss of over 130 horses as the result of a fire which broke out through "the burning wad of the 9 o'clock gun" (Theal, V, p. 43) setting alight the straw roof of the cavalry stables. A strong south-east wind spread the flames and much government property was destroyed.

[29] Smith (p. 54) mentions that of the ten veterinary surgeons who entered the Army in 1799, five proceeded to India, Joseph Erratt, 19th Light Dragoons, being "the first officer to enter that country". He was shortly followed by Thomas Burrowes, 8th Light Dragoons. The others were James Grellier, 22nd Light Dragoons, Richard Davies, 27th Light Dragoons, and Samuel Newman, 29th Light Dragoons. It is seen from the context that Burrowes did not reach India until 1802 or 1803, but the names of these pioneers must be remembered since (except Burrowes who was actually *stationed* here) all touched at the Cape *en route* to India to join their regiments.

In 1799 commenced the Third Kaffir War. In 1801 an epizootic of horsesickness swept through the eastern part of the Colony, but it is not known whether the 8th Light Dragoons suffered any loss.

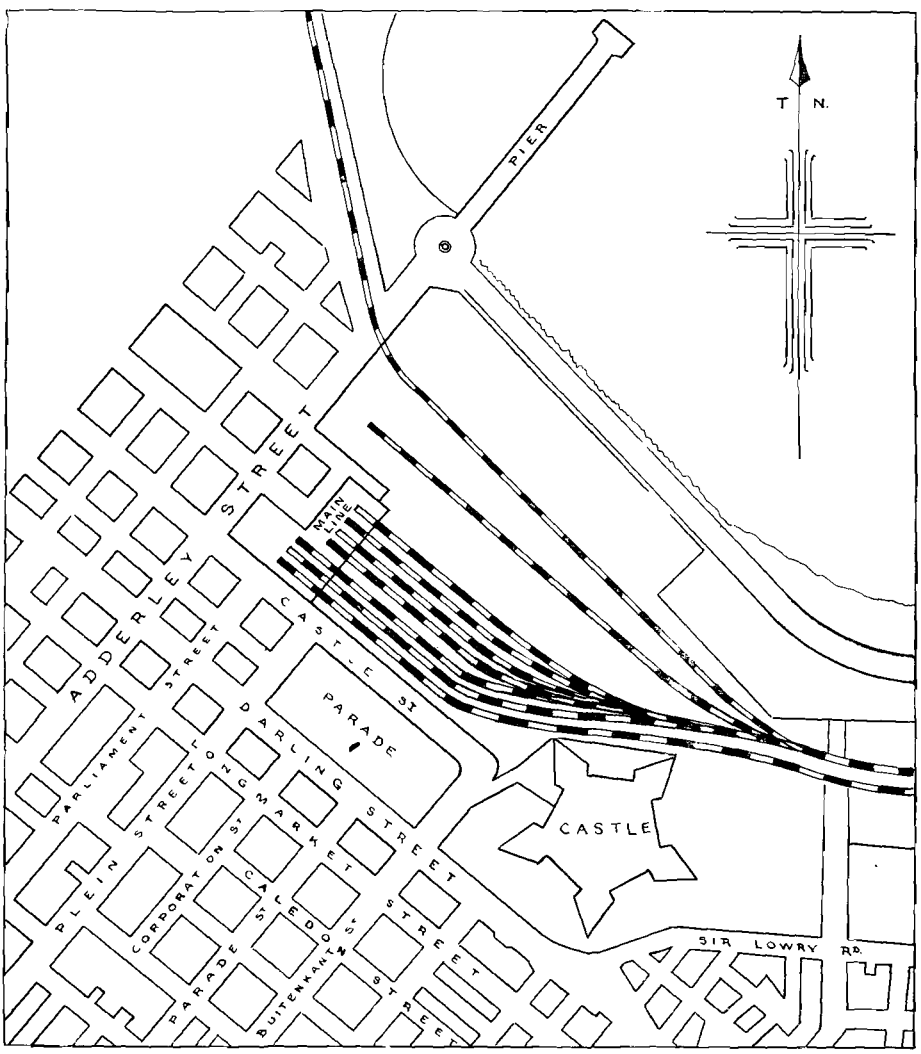

Fig. 3.
PLAN SHOWING APPROXIMATE SITE OF CAVALRY STABLES, CAPETOWN, 1795—1803.
See accompanying letter (page 100).

As a result of the Treaty of Amiens (March 27th, 1802), the Cape of Good Hope was restored to the Batavian Republic, but the formal handing over was not completed until the 20th February, 1803, when Dutch soldiers occupied the Castle and neighbouring forts, and some of the horses of the 8th Light Dragoons were handed over to the new government (Theal, V, p. 95).

The 8th Light Dragoons, which had numbered approximately 444 men on its arrival at the Cape, had already been despatched to India, except for 150 men. About 310 dragoons had left in September, 300 followed in November, and the remainder proceeded to India in February 1803 [30]. In this year the Regiment took part in the Second Mahratta War.

With regard to civil officials, William Duckitt, who had been brought out from England by Sir George Yonge in 1800 to establish an agricultural department of the civil service [31], did not leave with other British officials, preferring to make South Africa his home. At this period, the Cape horse [32] was gradually improving in quality, so much so that by the fifties there was a big export trade with India.

(c) Campaigns in South Africa 1795—1881.

The subjoined Table II summarises not only the campaigns, both Imperial and Colonial, conducted between 1795 and 1881, but also (a) the awards granted and (b) the names of the Army veterinary surgeons participating.

(d) Thomas Burrowes.

It is to be regretted that no portrait of Thomas Burrowes, the pioneer of the profession in South Africa, is available. All that is known concerning him is that he qualified at the London Veterinary School on March 30th, 1799, entered the Army soon after, being appointed to the 8th Light Dragoons, and joined the regiment at the Cape where it was on garrison duty. He proceeded to India with his regiment and took part in the Second Mahratta War (1805), distinguishing himself at the famous Battle of Laswari. Smith (pp. 54 and 55) mentions that although the Regimental History of the 8th Hussars refers to the bravery of a "Cornet" Burrowes, it is doubtful whether the incident described concerns the officer in question. He adds, however, it "appears almost certain . . . that Burrowes . . . did something on that day to attract attention" [34]. Confirmation is required for the statement in the

(30) Early in 1801, 85 men of the 8th Light Dragoons, along with other troops, left in a squadron under Sir Home Popham for the Red Sea, where operations were in progress against the French in Egypt.

(31) In later years the Veterinary Division formed an important part of this organisation under the wise guidance of Duncan Hutcheon (1842—1907).

See *The Cape Horse* (1915). Thesis presented by Schreuder, P. J. v. d. H., for the degree of Ph.D., Cornell University.

(34) While at Aldershot in 1931 the Officers' Mess of the 8th Hussars, on being informed by Major G. Pryer, R.A.V.C., of the Regiment's association with our profession, sent a framed engraving of an Officer and Trumpeter of the unit (Review Order) by Hayes and Lynch about 1838. It may be added that the motto of the 8th Hussars *Pristinae virtutis memores* was adopted by the South African Veterinary Medical Association in 1933. See cover.

TABLE II.

Campaigns in South Africa, 1795—March 1881.

Date.	Campaigns. (Colonial campaigns in black.)	Imperial Cavalry Regiment.	Award.	Further Remarks.
1795	First Occupation of Cape.	No cavalry at Cape.	No award.	—
1799	3rd Kaffir.	8th Light Dragoons.	No award.	V.S. Burrowes probably present.
1806	Second Occupation of Cape.	20th Light Dragoons.	No award.	V.S. Hargrave probably present.
1811	4th Kaffir.	21st Light Dragoons.	No award.	V.S. Levett probably present.
1818	5th Kaffir.	No cavalry at Cape.	No award.	—
1834—35	6th Kaffir.	Cape M.R.	Medal issued 1854.	No V.S. at Cape
1846—47	7th Kaffir.	7th Dragoon Guards.	Medal issued 1854.	V.S. Gardiner present.
		Cape M.R.		V.S. Kingsley present.
1850—53	8th Kaffir.	12th Lancers.	Medal issued 1854.	V.S. Thacker present.
		Cape M.R.		V.S. Kingsley present.
1852	Basutoland.	12th Lancers and Cape M.R.	Medal issued 1854 *.	Either V.S. Thacker or Kingsley probably present.
1877—78	9th Kaffir.	No cavalry at Cape.	Medal issued 1880. Bars dated 1877-8, 1877-8-9, 1878-9, and 1879. Each man received a medal and not more than one bar.	V.S's. Duck and Glover present.
1878	2nd Sekukuni.			V.S's. Duck and Glover present. See Curson (1934).
1879	Zulu.	1st Dragoon Guards.		
		17th Lancers.		See Curson (1935).
1879	3rd Sekukuni.	No cavalry regiment.		See Curson (1934).
1879	**Moirosi.**	Campaign undertaken by Cape Government.		See Curson (1932).
1880—81	**Basutoland** (33).	Ditto.	Medal issued 1900 by Cape Government. A bar accompanied each campaign, including Bechuanaland.	See Curson (1932).
1880	**Transkei** (33).	Ditto.		—
1880—81	1st Anglo-Boer.	15th Hussars arrived Jan.; 6th Dragoons, 14th Hussars and 7th Hussars arrived in Feb., March and April respectively.	No award.	Only 15th Hussars took part in campaign. See Curson (1934).

(33) A campaign was also undertaken by the Cape Government in 1897 in Bechuanaland.

Jl. S.A.V.M.A. Vol. IV, (4), p. 239) that Burrowes was seconded from his regiment to qualify as a veterinarian.

(e) Conclusion.

Conditions are described at the Cape at the time of the First Occupation (1795).

During the period 1795—1803, as in Great Britain, certain veterinary duties which prior to 1796 had been shared by officers, quartermaster, and farriers became centred in the veterinary surgeon, now a graduate of the London Veterinary College.

The first regiment to be provided with a veterinary surgeon was the 8th Light Dragoons, still existing as the 8th (King's Royal Irish) Hussars, and to which in 1799 Thomas Burrowes was appointed. During this period the foundations of the state Department of Agriculture were also laid.

Although nothing definite is known of Burrowes' experiences, details of military veterinary interest have been provided in order that we may visualise his duties and difficulties, e.g. inspections at widely separated outposts, and new conditions of animal management.

Table II summarises the campaign up to March 1881 [35].

* Tylden states (*Jl. Soc. Army Hist. Res.* XIV (53), p. 40) that "the survivors of Cathcart's force received, in 1855, the S.A. General Service Medal with the date 1853 below the lion on the reverse." The Expedition, it will be noted, took place at the end of 1852, many of those engaged having also been in the Eighth Kaffir War. The medal issued in 1880 resembled that of 1854, but had "a Zulu shield and assegais" (below the lion) on the reverse instead of the date (*Rand Daily Mail* 30/3/34).

No. 12/9/18.

Archives Department,
Queen Victoria Street,
P.O. Box 6,
CAPE TOWN.
27th October, 1934.

The Officer Commanding,
Cape Command,
The Castle,
CAPE TOWN.

Dear Sir,

In reply to your letter of the 20th instant, No. 214/1/67, enquiring on behalf of Mr. H. H. Curson of the University of Pretoria for a photo of the site occupied by the cavalry stables (1795—1803), I would like to point out that according to the records these stables and several other government buildings in proximity of the stables were burnt on the 22nd November, 1798. Out of a total of one hundred and forty horses only six or eight were rescued.

A full account of the fire will be found in Theal's *Records of the Cape Colony* Vol. II, pp. 301—307.

As regards the actual site of the stables, I regret that I have no plan showing where these were. From the above account the stables are described as being about 250 yards from the Castle, and as there was a strong South-easterly wind blowing at

[35] An article on the medals of South Africa in "*The Star*," Sept. 22nd, 1928, should be read.

the time which carried the wad from the evening gun fired from the Castle, we would expect to find the stables in a N.W. position. This was also the situation of several other government buildings destroyed by the fire, *e.g.* the Commissariat Stores. The site of the latter, shown on ground plans of Cape Town, was situated in the vicinity of the present platforms Nos. 13—14 of the Cape Town Railway Station. Although I cannot state with authority, I have concluded that the stables were somewhere in that part of the railway station from which the suburban trains depart.

Yours faithfully,

(sgd.) C. GRAHAM BOTHA,
Chief Archivist.

CHAPTER III.

Position in Cape Colony, 1806—1840.

(a) From the Second Occupation of the Cape to the Appointment of W. J. Kingsley, V.S. Cape Mounted Riflemen. (b) List of Army Veterinary Surgeons who served in South Africa up to March, 1881 (Table III). **(c) Conclusion.**

(a) From the Second Occupation to the Appointment of W. J. Kingsley.

During the three years the Cape of Good Hope was held by the Netherlands (1803—06) a detachment of 200—300 dragoons formed part of the garrison, but it was hardly likely that a veterinary surgeon was attached [36].

When in 1805 the British Government decided to re-occupy the Cape in order to forestall the French, 4 troops of cavalry were included in the expeditionary force. The contingent under the command of Sir David Baird left Great Britain in July, 1805, and numbered approximately 6,000 men. The cavalry, 20th Light Dragoons [37], and some artillerymen had been intended for service in India, but were temporarily attached to the Cape expedition. Table Bay was reached on the eve of January 4th, 1806, and as the " surf was so violent " it was considered advisable to land at Saldanha Bay; in fact, an infantry regiment (now South Staffords) and the 20th Light Dragoons on the night of the 5th proceeded thither and landed on January 6th [38]. The main force, however,

(36) See reason given in Chapter II. During the regime of the Batavian Republic, De Mist appointed a commission to carry out improvements in agriculture and stock breeding (Theal, V, p. 118).

(37) Fortescue (1921), V, p. 306, says 200 in number.

(38) See Curson (1931) where it is stated that the dragoons " proceeded overland to Cape Town ". Details concerning this march are to be seen in a document prepared by Lt.-Col. R. Wilson, 20th Light Dragoons, and reproduced *in extenso* by Theal (1899, p. 320). Maj.-Gen. Beresford, the officer commanding the Saldanha Bay force, with the mounted men, reached Cape Town on Jan. 10th, the day of the capitulation. These units were not awarded the battle honour " Cape of Good Hope 1806."

disembarked at Melkbosch Point, about fifteen miles north of Cape Town on January 6th and 7th, and on the 8th the Dutch army was defeated at Blauberg.

On the voyage the fleet had anchored off San Salvador, Brazil, where in addition to provisions, about seventy horses were taken aboard, "many of which died on the further voyage to the Cape" (Cory, I, p. 144).

Immediately after the occupation of Cape Town, General Baird gave instructions that all saddle horses were to be taken to the barracks and, after valuation, handed to the military with the promise that as soon as peace was restored, they would be returned; otherwise the owners would receive full value. Indeed, he applied (Jan. 12th, 1806) to Whitehall for cavalry reinforcements, and some months later issued an order (Proclamation of July 16th, 1806) that a fine of £10 would be imposed upon a farmer who refused to furnish his wagon, oxen, or horses for public service upon the requisition of a field cornet.

The 20th Light Dragoons was at the Cape for such a short period that there is little to record concerning its stay. Theal, in referring to reinforcements for the Rio Plata expedition, states (V, p. 158): "To it (*i.e.* the 47th Regiment) were added ... that portion of the 20th Light Dragoons which was in South Africa and 158 of the 21st Light Dragoons. ." [39]. The regimental veterinary surgeon was W. Hargrave who qualified in 1804, and entered the Army on May 25th, 1805. Sir Frederick Smith (letter dated January 11th, 1928), mentions that the horses of the 20th Light Dragoons were taken over by the 21st Light Dragoons, which arrived in July, 1806.

The 21st Light Dragoons remained at the Cape for 11 years during one of the most critical periods in the history of the country. As just indicated, the regiment had barely landed when 158 men were sent to Rio Plata. The veterinary surgeon from 1806 to 1812 was W. Levett, and from 1813 to 1817, J. Schroder. The event of greatest importance during its stay was the Fourth Kaffir War (1811—12), but prior and subsequent to this, detachments were engaged on garrison and patrol duties particularly along the stormy eastern frontier. Uitenhage, being near the Fish River, the colonial boundary, fared particularly badly. The position became so serious at the end of 1809, that in January, 1810, a company of the regiment, along with other troops, was sent to the frontier, a section being stationed at Bruintjes Hoogte under Captain Evatt.

(39) The reinforcements left for South America at the end of August. The Rio Plata expedition, although at first successful, was ultimately a failure. V.S. Lander of the 9th Light Dragoons lost his life in the attack on Buenos Ayres and was the first veterinarian killed in action (Smith, p. 74).

Fortescue (V, p. 368) states that there were 191 20th Light Dragoons and 140 21st Light Lragoons.

As no energetic measures were taken to punish the marauders, the mere presence of troops along the border served but little useful purpose. Indeed, in 1809, Cungwa, one of the troublesome chiefs, when asked why he had moved his kraals westward, " replied that it was on account of the health of his cattle " (Cory, I, p. 228). The following year when asked the same question, his reply was that the movement was for his own health !

The dragoons despatched to the frontier in 1810 were fully equipped except for horses, but the Government had ordered that Rds. 60 (£4 - 10 - 0) should be paid for each horse to mount them; "this sum. from the prices that horses" fetched at that time, might "appear inadequate to the procuring of the necessary number of horses" (from circular from J. G. Cuyler, Magistrate, Uitenhage, to local Field Cornets, dated January 25th, 1810. Cory, I, p. 222). Burghers, however, with spare horses " patriotically complied with " the above request; but were later disappointed at the inertness of the military, so much so, that they were themselves compelled in August to move their herds to more settled areas, *e.g.* nearer to Graaff-Reinet.

Although Major Cuyler had suggested early in 1810 that an Imperial-Burgher force should expel the invaders, nothing was done until the end of 1811 when Sir John Cradock became Governor. These operations constitute the Fourth Kaffir War [40].

Following the Fourth Kaffir War, when the natives were driven eastwards across the Fish River, the Governor decided that the Hottentot Corps should be moved from its headquarters at Riet Vlei near Salt River, Cape Town, to a point (now Fort England) near the Fish River. Near this station were laid in 1812 the foundations of Grahamstown (Dr. A. W. Burton, letter Oct., 1934).

This measure not being sufficient to keep back the tribesmen, Lord Charles Somerset in 1817 visited the disturbed area. At a meeting with Gaika, it was arranged, in order to put an end to stock thieving, that " when animals stolen from the Colony were traced to or ' spoored ' to a kraal, that kraal should be visited and the animals retaken; in the event of the animals not being there, which was likely to be the case, the owner of that kraal was then to be held responsible for tracking the ' spoor ' further or to have his own cattle taken " as compensation (Cory, I, p. 305). In addition, the Governor decided that a line of military posts should be built along the Fish River, between the Zuurberg and the sea in order more effectually to protect the border farmers. Accordingly, fourteen posts were erected along the eastern frontier, *i.e.* along the Fish River, and eleven " more within the Colony," extending from Cookhouse to the mouth of the Sundays River. " Each post had a number of the 21st Light Dragoons for the purpose of speedy communi-

[40] To be described elsewhere.

cation between the various places . . . Patrols went out daily, morning and evening, and any trace or spoor of cattle was followed up to the first kraal of Kaffirs and compensation demanded" (Cory, I, p. 310).

Unfortunately for the struggling settlement just as there was promise of peace, orders were received for the reduction of the garrison and the 21st Light Dragoons, "by far the most useful body of troops in the country" (Theal, V, p. 267) was transferred to India. Altogether the Cape garrison was reduced to 2,744 men [41] and not a single Imperial cavalrymen [except the 78 mounted men of the Hottentot (now Cape) Corps] was left in the country. "The withdrawal of so many troops, and more especially the cavalry, completely wrecked the scheme of frontier defence". (Professor L. Fouche, *Rand Daily Mail,* April 28th. 1934.)

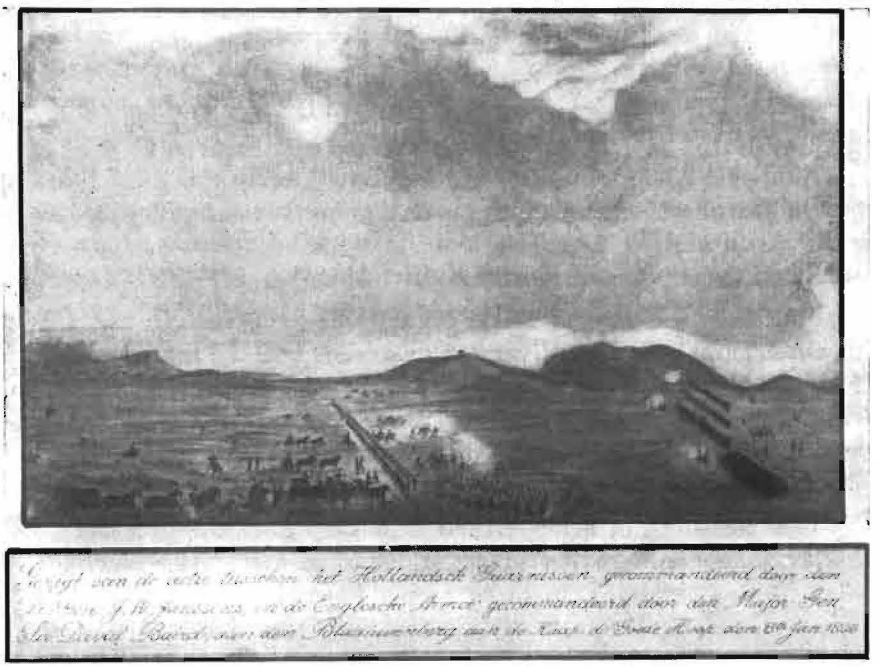

Fig. 4.

BATTLE OF BLAUBERG, JANUARY 8th, 1806.

After 1817 there is a hiatus of 23 years [42] in the history of our profession, the next veterinary surgeon to follow J. Schroder of the 21st Light Dragoons being W. J. Kingsley, who was attached to the Cape

(41) Of which approximately 1.500 were necessary on the frontier—Lord Charles Somerset's estimate (Cory, I, p. 401).

(42) The next and final hiatus was 1870—1874, *i.e.* from the disbandment of the C.M.R. to the appointment of Samuel Wiltshire as Colonial V.S. of Natal. It must be emphasised that J. Winter was in private practice in Natal in 1873, but when he arrived is not known.

Mounted Riflemen, probably in 1840. Sir Frederick Smith, after searching for the date of Kingsley's appointment, wrote (March 3rd, 1927): "I cannot give the name of the veterinary officer earlier than 1841". Bayley (1856), however, indicates, in a footnote on page 51 of his publication (see Fig. 9) that the year was 1840.

The date 1817 is also important, for in this year the Hottentot Corps was replaced by the Cape Corps, which in 1818—19 performed excellent service in the Fifth Kaffir War [43]. In 1827 it was partly mounted and given the title of Cape Mounted Riflemen (1827—1870). As will be noted in Fig. 9 the designation Cape Mounted Rifles was also employed, a name sometimes wrongly applied to the permanent mounted corps created by the Cape Colonial Government in 1878 and disbanded in 1913. See Table III which gives a list of Army veterinary surgeons who served in South Africa up to March 1881, the date when the Army Veterinary Service became completely departmentalised.

Soon after the arrival of the 21st Light Dragoons, in 1807 to be precise, and while the Commanding Officer, Lieut.-General H. G. Grey, was acting Governor, there was established a Supreme Medical Council [44]. The function of this body was to prevent unqualified persons from practising medicine, and in order to ensure this all practitioners, including apothecaries, were required to submit their certificates of qualification to the Council. Persons not possessing such a certificate were accordingly examined by the Council.

Of particular importance to veterinarians was the progress made at this period in building up the horse and the sheep industries of the Colony. Schreuder (1915) states: "Lord Charles Somerset once having grasped the situation took the lead himself and financed the first batch of 34 thoroughbreds from England and although he lost heavily . . . he persevered until he left the land where every horse breeder will remember him with gratitude and admiration" (p. 32). His objects were not only to benefit the Cape farmers, but also to have a source of horseflesh available for military purposes. So successful was this policy that in 1817 Lord Charles Somerset wrote to the Secretary of State that he was "on the eve of closing a bargain to export annually 400 horses for the Madras Cavalry exclusive of a proportion of better horses for the officers" (p. 32).

The trade appears to have flourished until after the Indian Mutiny (1857—1858) for which event 5,482 [45] horses and 198 mules to the

[43] In preparation.

[44] See *Die Staatsamptenaar* of October, 1934, for article entitled „Volksgesondheid in die Kaap Kolonie, 1652—1910" by P. J. Venter.

[45] Several of the Imperial cavalry regiments participating in the Crimea (1854—55) were mounted on Cape horses obtained in India. Schreuder (p. 45) mentions that they "acquitted themselves admirably in that most trying campaign."

value of £215,645 were bought in South Africa " (p. 33). In fact from 1840 to 1860, the palmy days of the industry, the Indian Government stationed a remount officer in this country. Among the best known officials were Col. Apperley, Lieut.-Col. Richardson, Col. Havelock, Major Baker and Lieut.-Col. Bower. Apperley's portrait may be seen in the April, 1860, issue of the *Cape Monthly Magazine*.

The reasons for the decline are several, but probably the most important was that Australia (to which country the first horses were exported from South Africa in 1810) had become a serious rival from about the sixties. It is clear that Australia maintained her position, for, writing sometime later, Moore (1921), who was Director of Veterinary Services of the British Expeditionary Force in 1914, states : " There is now not a single type or class of horse for military purposes, from the light Indian cavalry to the heavy artillery draught, which cannot be procured in Australia " (p. 107).

It is significant that although the Madras Government in 1858 (and for fourteen years previously) had offered £57 - 10 - 0 for a suitable remount " to be judged by a committee of officers at Madras " (p. 44) only one importer accepted the risk and then only on one occasion, when of 13 horses 6 were passed.

Although British settlers had been located along the eastern frontier in 1820 there was little or no intermission in the eternal border unrest between Xosa and European.

In spite of this, " in December, 1827, as a measure of retrenchment the infantry of the Hottentot regiment (Cape Corps) were disbanded by order of the Secretary of State, and the (250) cavalry . . . . was thereafter termed the Cape Mounted Riflemen " (Theal, VI, p. 85). Six years later occurred the Sixth Kaffir War (1834—35) as a result of which particularly heavy losses of horses were sustained by the mounted troops. Possibly the appointment of a veterinary surgeon to the Cape Mounted Riflemen in 1840 *viz.* W. J. Kingsley, can be traced to the lack of veterinary supervision in that campaign.

As a result of the reversal of Sir Benjamin Durban's policy of frontier extension in 1836, changes took place beyond the colonial borders, changes initiated by the wholesale departure from the frontier of the hardy Dutch settlers [46]. These developments, as will be seen later, led to the settlement of what are today the provinces of the Orange Free State, Natal, and the Transvaal.

Another event deserving of record in this chapter was the gradual change, commencing in 1825 [47], when transport by sea was expedited

[46] Remember also that the veil obscuring the mysteries of the Subcontinent was being slowly raised by the efforts of the pioneers such as Cornwallis Harris, Livingstone and many others.

In 1825 the first steamship, *Enterprise*, arrived at Cape Town.

TABLE III.

List of Army Veterinary Surgeons who served in South Africa before complete departmentalisation of A.V.S., 1795—1881.

	Name.	Born.	College.	Qualified.	Gazetted.	In South Africa From.	To.	Retired.	Died.	P=Photo. *=Career. Notice of Death.
1.	Burrowes, Thomas		London.	30.3.1799	1799	1799	1803		—	—
2.	Hargrave, William		London.	1804	25.5.05	1806			—	—
3.	Levett, William		London.	1797	12.4.99	1806	1812		—	—
4.	Schroder, J.		London.	1812	25.6.12	1813	1817		—	—
5.	Kingsley, W. J.		London.	1838	29.3.39	1840	1860		1867.	—
6.	Gardiner, B. C. R.	1824	Edinburgh.	1843	9.5.46	1846	1848	21.7.79	3.9.99. Ilfracombe.	*Vet. Rec.* 21.10.99.*
7.	Thacker, James		London.	31.1.44	14.7.46	1851	1853	1875	25.6.76. Melbourne.	*Vet. Jl.* 1876, p. 314 (III).* *See Smith* (1927).*
8.	Paton, Thomas		Edinburgh.	Diploma of the High. & Agr. Soc. 1855	15.8.55	1861	1870		1876, At Sea.	*Vet. Jl.* IV p. 61.*
9.	Marshall, Frederick Fitzhugh		London.	1854	22.6.60	1862	1869	20.1.86	25.8.05. Blackheath.	*Vet. Rec.* 16.9.05.*
10.	Duck, Francis, Sir (48)	1845	London.	1867	1867	1878/9 & 1881/5		15.10.02	May, 1934, S. Rhodesia.	P. *Vet. Rec.* 19.5.34. See *Smith.* (1927)*
11.	Glover, Benjamin Lucas	21.12.48	London.	1870	27.8.70	1878	1879		18.4.04, Dublin.	*Vet. Jl.* May '04* P.
12.	Burt, Walter	1839	London.	1860	11.9.60	1879	1880	4.11.93	22.9.05, Eastbourne.	*Vet. Rec.* 30.9.05.
13.	Fenton, Gerald Herbert	1852	New Edinburgh.	1874	5.10.78	1879		17.1.00	2.10.15.	*Vet. Rec.* 9.10.15.
14.	Gudgin, Tom Parinder	1831	London.	1850	10.6.54	1879		27.7.85	1.5.03, St. Leonards.	*Vet. Rec.* 9.5.03.*
15.	Hagger, William Robert		London.	1875	13.7.78	1879		7.12.01	2.12.03, Bombay.	*Vet. Rec.* 26.12.03.*
16.	Healy, M. F.	8.3.39	Edinburgh.	1862	30.6.63	1879		8.3.94	30.4.21.	—
17.	Killick, Thomas Alexander	1853	Edinburgh.	1878	30.10.78	1879		1898	24.6.06, Shorncliffe.	*Vet. Rec.* 14.7.06.*
18.	Lambert, James Drummond	1835	Edinburgh.	1855	1857	1879 & 1881/82		28.6.97	3.3.05, Manchester.	*Vet. Jl.* May, 1905.* See *Smith* (1927)* P.
19.	Longhurst, Seaward		London.	1873	14.6.73	1879	1880	9.11.98	28.10.25, Ash.	*Vet. Rec.* 7.11.25.*
20.	Moore, Robert (48)	8.12.51	New Edinburgh.	1875	30.11.78	1879	1880	12.12.06	1913.	—
21.	Morgan, John William Akerman	29.10.56	London.	1877	11.6.78	1879		7.12.01	20.12.10.	—
22.	Phillips, C.	26.1.51.	London.	1870	—	1879	1880		4.6.95. Dublin.	*Vet. Jl.* July '95.* See *Vet. Rec.* 9/6/34 P.
23.	Raymond, Francis		London.	1877	14.12.78	1879		7.12.00	—	—
24.	Walters, William Barker		London.	1860	26.11.61	1879		24.2.94	21.9.09, London.	*Vet. Rec.* 5.10.29.* See *Smith* (1927).*
25.	Rayment, J. G. R. (48)	2.5.51	London.	1871	—	1879		11.6.02	7.7.03, Nigeria.	*Vet. Jl.* August, 03.*
26.	Gladstone, W. (48)	6.1.50	Edinburgh.	1874	10.6.74	1879			13.10.00.	—
27.	Caldecott, T.	16.7.58	New Edinburgh.	1880	9.6.80	1881		17.4.89	1891.	—
28.	Durrant, G.		Albert.	1868	2.12.68	1881	1882	17.5.02	9.10.02, Woolwich.	*Vet. Jl.* Nov. '02.
29.	Gillard, Charles Whitney		London.	1871	20.7.71	1881		24.7.95	19.8.05, Sidmouth.	*Vet. Rec.* 23.9.05.*
30.	Jones, Adrian Alfred		London.	1865	11.1.67	1881	1882	10.6.91	—	*Vet. Rec.* 30/12/33 P.*
31.	Pallin, Daniel Chambers (48)		New Edinburgh.	1874	20.4.77	1881		4.6.02	29.5.12, Gillingham.	*Vet. Rec.* 8.6.12.*
32.	Pallin, William	26.9.43	Edinburgh.	1863	14.1.71	1881		29.10.81	8.6.07, London.	*Vet. Jl.* July '07* P.
33.	Reilly, James	1.6.47	Edinburgh.	1867	7.8.67	1881	1882	1.6.02	3.3.22.	—
34.	Rutherford, Charles		Edinburgh.	1879	—	1881	1886	24.3.18	2.4.22.	*Vet. Rec.* '29.4.22.
35.	Sartin, W. D.	1848	London.	1869	11.7.69	1881	1882	—	4.4.82, At Sea.	*Vet. Jl.* June '82.
36.	Findlay, J.	—	Glasgow.	1870	—	1881		1883	1883	—

(48) F. Duck was again in South Africa, 1884/5 Campaign.
C. Rutherford was again in South Africa, 1884/5 Campaign.
Robert Moore was again in South Africa in 1896.
W. Gladstone was again in South Africa, 1899/1902 Campaign.
D. C. Pallin was again in South Africa, 1899/1902 Campaign.
J. G. R. Rayment was again in South Africa, 1899/1902 Campaign.
C. Rutherford was again in South Africa, 1899/1902 Campaign.

through the replacement of sailing ships by steamers. The advantages from a veterinary standpoint, both military and civil, are so striking that further comment is needless.

Thus ended a period of thirty-four years, twenty-three of which (1817—40) were characterised by the absence of a veterinarian in the Cape Colony.

(c) CONCLUSION.

An account is given of cavalry movements during the Second Occupation (1806) and while the 21st Light Dragoons was at the Cape. The genesis of the Cape Mounted Riflemen in 1827 is also briefly referred to. Had it not been for the three veterinary surgeons attached to this unit, between 1840 and 1870, instead of an interval of 23 years elapsing without an Army veterinarian in the country, the period would have been 61 years, *viz.* 1817 to 1878. Table III contains various details concerning the military pioneers of the profession up to March, 1881.

Contemporary events of veterinary interest are mentioned.

(To be concluded.)

Durban Municipal Abattoir.

As a result of numerous complaints mostly from cattle breeders in Natal, a Commission was appointed on 28th March, 1934, to enquire into the alleged excessive fees levied at the Durban abattoir. Vague references had been made to "globular sums" representing trading profits, which were yearly applied towards the alleviation of rates at the expense of the farmer. It is significant, however, that none of the fees charged were individually attacked since apparently they compare favourably with those levied elsewhere. The full report of this Commission is published in the "Natal Provincial Gazette" of November 18th, 1934.

While the Commission was largely concerned with financial questions, it also commented on the technical aspect of the administration and found "that the Abattoir was well founded, equipped, staffed and managed, and conducted with a high standard of technical skill."

These remarks coming as they do from an authoritative and independent body, are very gratifying and reflect favourably on the ability of our colleague in charge of this abattoir. It is also a welcome encouragement to the policy of this Association in agitating for veterinary supervision of all our more important abattoirs.

It is pleasing to note, furthermore, that the Commission's report was well received by the Durban Council and resulted in a recommendation by the Markets and Abattoir Committee for reviewing the Abattoir Director's salary. It is understood that the post will now be graded on the B scale, i.e. £1,100—£1,400 subject to the Corporation's deflation scheme. Mr. Dykins is to be heartily congratulated on this early and tangible reward for his well directed efforts.

Jl. S.A.V.M.A.
VI (2) 1935.

THE LAW AND THE VETERINARIAN. VII.

By C. P. BRESLER, M.A., LL.B., PRETORIA.

NEGLIGENCE (*continued*)

Although I had intended my last article to be complete in itself, within a very limited compass (that is), I feel that it might be interesting as well as instructive to refer to a book recently reviewed in these pages, namely *Précis de Droit Vétérinaire*. It must however be borne in mind that the author is referring to a totally different system of law and one that moreover is governed by code. None the less I am certain that the comparison will be instructive and not confusing. I propose confining myself to the chapter dealing with *Des Responsabilités*. The title of course explains itself. Writing of *Des responsabilités en général* the author says: One may define responsibility, in a somewhat wide sense, as being the obligation to answer for one's conduct either in respect of the things of another or indeed in respect of any matter which has been entrusted to one. "Liberty of action exists in so far as that action is not permitted to strike a blow at the rights of another or at the social order; anyone who exceeds these limits is dealt with in the first instance by the civil code and its supplementary laws and in the second place by the penal code and the relevant penal laws. Any infringement of the provisions of the civil code, that is to say any act that is injurious to the interests of another perpetrated without wrongful intent (*quasi-délit*) imposes civil liability (*responsabilité civile*) on the doer; in other words he is under an obligation to make good the injury, be it by restitution to the other party, be it by paying the total damage incurred (*dommages-intérêts*), meaning a pecuniary compensation for all the loss caused by any transgression of the penal code. In other words, any illegal act whereby a person knowingly or wrongfully invades the rights of another (*délit*) involves the author thereof in penal liability, in other words it compels him to make reparation to society be it in the form of fines which since the war are for the greater part in excess of sixty decimes, be it by imprisonment, or be it by both forms of punishment together."

Coming to *Responsabilité Civile* the author says that under this rubric we are face to face with an aspect of damages caused to another in consequence of a *quasi-délit* on the one hand and of the rights of ownership in certain instances susceptible of litigation on the other.

In dealing with damages due *par faute* or through negligence it is pointed out that civil responsibility is governed by articles 1382, 1383, 1384, 1385 of the Civil Code. (I may add that, on reference to the Code.

these articles are found to read as follows:—

> Art. 1382. Every act whatever of an individual which causes injury to another obliges the one owing to whom it has occurred to make up for it .
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> Art. 1383. Every one is responsible for the injury which he has caused not only owing to his own act but owing to his negligence or imprudence.
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> Art. 1384. A person is responsible not only for the damage which he causes owing to his own act, but also for that which is caused by the acts of persons for whom he is answerable or by things which are in his custody. (Law of November 7, 1922). Nevertheless a person in possession in any capacity of all or part of a piece of real estate or of personal property is responsible towards third parties, in case of fire, for the damage occasioned only if it is established that the fire was caused by his negligence or the negligence of persons for whom he is responsible. This provision does not apply to the relations between landlords and tenants which are governed, as in the past, by articles 1733 and 1734 of the Civil Code. The father, and the mother, after the death of the husband, are responsible for the damage caused by their minor children living with them. Masters and employers are responsible for the damage caused by their pupils or apprentices in connection with the duties attached to their employment. Schoolmasters and mechanics are responsible for the damage caused by their pupils or apprentices during the time they are under their supervision. The above liability exists unless the father, mother, schoolmasters, or mechanics prove that they have not been able to prevent the act which gives rise to such liability. (Law of July 20, 1899). Nevertheless the civil responsibility of the State is substituted for that of the teachers of public instruction.
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> Art. 1385. The owner of an animal, or the person who uses it is, while such use lasts, liable for the damage which the animal has caused, whether it was under his care or whether it was lost or had escaped.

In dealing with articles 1382 and 1383, the author explains that in order to saddle anybody with liability it is necessary:—

(1) "That there should be damage, whether it be material or 'moral'; damage is the loss sustained by anyone in respect of his possessions, his person, his reputation, his dignity, etc.; the law has always provided for reparation for a material loss and now is prepared to award similarly damages for mental consequences flowing from pain caused by material harm such as has in it the germ of mischief (*Cass. fr.* 13 *février.* 1923).

(2) " that the fact or act must be the cause of loss; it must be ' illegal,' that is to say not permissible by law: an illegal act on the part of the administrative authority gives rise to reparation to the same extent as that committed by an individual (*Cass. b.* 5 *novembre*, 1919); a lawful act constituting the legitimate exercise of the law does not involve the doer thereof in any responsibility.

(3) " That the conduct should be imputable to the doer; the latter ought to be *en faute*, that is to say that he has done what was not permissible or he has failed to do what was necessary so that he has done damage which may be either positive or negative (such as an omission). Whomsoever is afflicted with insanity or who has obeyed an irresistible impulse is not responsible for the damage caused by his conduct to another (*Cass. fr.* 21 *October*, 1901): the term *faute* contemplates implicitly the circumstances reducing responsibility on the part of the doer for damages. Thus the owner of an animal may prove that the accident is due to *force majeure* such as fury, and " wickedness" (*méchanceté*) which it would have been impossible to foresee or minimise. Co-authors of the same *quasi délit* are liable to be condemned jointly and severally (*Cass. b.* 27 *décembre*, 1883)."

The comments of the author on article 1385 naturally excite the most interest:

" The plaintiff is required to prove that it was in fact the animal which caused the accident. (*Cass. fr.* 29 *janvier*, 1906). The responsibility of the owner ceases and the presumption is destroyed when the accident is due to a *casus fortuitus* or is imputable to the *faute* of anyone who has brought about the damage. (*Cass. fr.* 11 *mars.* 1902): so that when a youngster is bitten by a dog after having provoked it, the owner of the dog is not responsible but he must prove that not only did he not commit the wrong (*faute*) but that the victim had committed one (*trib Verrers*, 21 *décembre*, 1915); in the same way the owner of a dog is not responsible for the bite wounds inflicted on someone who penetrates without credible reason into closed premises when there was no call and where on the contrary he had been warned by the caretaker or by notice of the danger to which he was exposed (*Cass. fr. janvier*, 1904): but there will be responsibility on the owner in the case where a dangerous dog left to roam about an enclosed garden bites a visitor (*Cour d'Appel Alger*, 24 *janvier*, 1879) or indeed a person who enters bent on some legitimate business as e.g. *facteur* (postman, tradesman, salesman, etc.) Anyone who entices a dog home with him and feeds it, although not holding himself out as being the owner, is responsible (*trib. Seine*, 14 *Janvier*, 1902): if the animal has been lent out the

responsibility will devolve on the borrower. (*Appel Bruxelles*, 31 *mai*, 1902). In so far as a vicious animal is concerned the owner cannot escape responsibility unless he has done everything in his power to forestall accidents by putting the public on its guard against these vicious instincts; the responsibility of the owner ceases when he has proved that he has taken all precautions humanly possible to prevent any damage resulting from the conduct of the animal (*trib. Liége*, 12 *juillet*, 1900).

If there has been *faute* on the part of both there will be an apportionment of responsibility and of *dommages-intérêts* which follow. This question of "bilateral" responsibility applies for example in the case of a fight between two dogs: when one has caused the other serious wounds it is incumbent on the owner of the animal which has caused the wounds in question to establish, in order to escape liability, that his dog had been attacked or provoked by the other (*trib. Bruxelles*, 4 *janvier*, 1910). Leschevin points out that when one is not able to establish who was the aggressor these instances are to be treated as being in the category of a *casus fortuitus* not involving responsibility for death or wounds inflicted in the course of a struggle (Toullier), while others hold that each owner is repsonsible for the injuries caused to the animal of the other (Sourdat). The owner of an animal remains responsible for damage caused by his animal which he has entrusted to a third party not for the purpose of rendering him service but for purposes of protection (*Appel, Paris*, 10 *mars*, 1802)."

The author completes his commentary with certain contemplations on the provisions of the rural code relating to animals abandoned or strayed, pigeons, bees, and game:—

"Article 1385 of the Civil Code applies to domestic animals which have been neglected: the depredations which they cause are imputable to those persons who hold them either in ownership or in enjoyment: these fall besides under the penalties provided for by article 88 of the law of the 7th October, 1886; this is the case for cattle and fowls and birds of the farmyard which commit depredations on the neighbouring harvests of the settlements. For poultry the rural code of France also provides that "anyone who has suffered damages is entitled to kill the poultry but that only on the spot, at the moment of the depredation and after failure to appropriate them" (Art. 4 of the law of the 54th April, 1889). S. Fons points out that the right to kill does not include poisoning, because the legislature seems to have intended to allow the owner of poultry killed in these circumstances the use of them after death; according to this text one has not the right to prepare a trap of one's own accord after having addressed an unavailing warning to the owner of the fowl or posted the notice: the reason is that these creatures may only be destroyed whilst

marauding at the moment and at the place where the destruction is taking place and this excludes the right to kill by way of prevention when the boundary of the field has been crossed; further, animals are not to be killed if they but traverse a field without pilfering, no more are they to be fired at from a distance when they are fleeing. The practice of setting snares is permissible in the case of dogs and cats; nevertheless there is a preliminary obligation to forewarn the owner, by sending him a warning letter (of which a copy is kept) of the intention, unless he is prepared to restrain his fowls and dogs, of killing them and of laying snares for the others without obviously tempting these last with bait. This satisfaction which is given one does not exclude the right to the *dommage-intérêts* which one is entitled to recover before a justice of the peace.

As to pigeons, the same provisions apply as to poultry.

Bees which occupy a hive involve their owner in responsibility.

The question of civil responsibility is not infrequently discussed under the heading of destruction caused by game; as the latter do not belong to the owner of the ground on which they are found one cannot apply article 1385 of the Civil Code. However the owner of a domain containing game would probably be held responsible in certain circumstances; thus any owner, who in his own interest in his own fields guards game which multiplies and causes damage, commits a *faute* for which he is responsible (*Cass. b.* 2 *juillet*, 1874); this obligation finds its source in the general duty incumbent on everybody to respect the property of another (*Cass. b.* 2, *mars*, 1922); but it is not enough that the game should cause devastation, it being again necessary to establish *faute* on the part of the owner (*Cass. fr.* 11 *mars*, 1902). The question of responsibility for damage caused by rabbits is dealt with by the law of the 28th February, 1882, under the chase, modified as it is by that of the 4th April, 1900; responsibility does not arise unless it is proved that the rightful owner who has stocked rabbits is at fault, more particularly in regard to having failed to destroy in a manner calculated to keep their numbers down below a normal and reasonable limit."

This concludes the translation of the relevant parts of the chapter but before concluding the article it will be advisable to refresh one's mind by referring to three notable cases decided in South Africa, dealing respectively with a bee, a bull, and a dog.

The occupier of a building is in general under no duty to take steps to eradicate a swarm of bees which have hived in the roof of the building, (*Wasserman v. Union Government*, 1934, A.D. 228). The judgment of Sir JOHN WESSELS, the Chief Justice, may well be quoted in its entirety. "In this case the applicant asks for leave to appeal *in forma pauperis* from a judgment of the Orange Free State Provincial Division. The late Wasserman was asked by the chief constable at Frankfort to

try and find out where the bees, which were disturbing him in his office at the police station, lived. Wasserman accordingly put his head out of the window of the office and he was stung on the lip by a bee, and unfortunately died from the sting. His widow claimed compensation from the Government on the ground that it had allowed the bees to hive in the roof of the police station. The whole question is whether it was the duty of the Government to eradicate the hive. The law is clear, and it was laid down with exceptional clarity by Sir JAMES ROSE-INNES, then Chief Justice, in *Cape Town Municipality v. Paine*, (1923 A.D. at page 216) as follows:

> 'It has repeatedly been laid down in this Court that accountability for unintentional injury depends upon *culpa*, the failure to observe that degree of care which a reasonable man would have observed. I use the term reasonable to denote the *diligens paterfamilias* of Roman law, the average prudent person. Every man has a right not to be injured in his person or property by the negligence of another, and that involves a duty on each to exercise due and reasonable care. The question whether, in any given situation, a reasonable man would have foreseen the likelihood of harm and governed his conduct accordingly, is one to be decided in each case upon a consideration of all the circumstances. Once it is clear that the danger would have been foreseen and guarded against by the *diligens paterfamilias* the duty to take care is established, and it only remains to ascertain whether it has been discharged.'

"Now I ask myself whether in these circumstances a reasonable man would have guarded against this danger from the hive. The facts are that in the country town of Frankfort bees had hived high up in the roof of the police station for some considerable time. None of the police had taken much notice of them though they knew they were there and knew the danger of bees. I must accept as a fact that in this country bees are everywhere; even in a big town like Pretoria there are bees under the roofs of houses and in hollow trees. In the country they are very numerous, and we all know the dangers arising from a bee's sting. The facts show that the Government had not kept the hive as movable hives were kept in the cases referred to in argument. In these cases which are clearly distinguishable, it was held to be dangerous to place a movable and artificial hive in close proximity to house. It is quite a different matter where bees of their own accord hive in roofs and hollow trees. Is a reasonable man required to guard against such a danger? It would be idle to deny that there is a potential danger in every bee. But there are billions of bees in South Africa and it is difficult to know where they may or may not hive. It would, therefore, not be reasonable to say that an occupier of a house must in every case take steps to eradicate the bees from the roof of his house because of the danger to which those members of the public whom he invited into his house, and passers by, might be subjected. We have the evidence

of Mr. Taylor who is an expert on bees; he is in Government employ as an entomologist, and is himself in charge of a number of hives. He says he never would have thought that there was any danger from bees in a roof. If such a man would not have thought it dangerous, one should not expect a reasonable man to anticipate injury from bees in the roof of a house. To be stung by a bee is one of the ordinary risks of life in this country where bees are ubiquitous.

"In these circumstances there was no *culpa* in allowing bees to hive in the roof of the police station nor was there *culpa* on the part of the head constable in asking Wasserman to see whether he could find out where the bees came from."

DE VILLIERS, *J.A.*, in a concurring judgment, expressed himself as follows:—"There does not seem to me to have been such a degree of likelihood of a fatal injury being caused by the bees as to cast on the Government the burden of anticipating it. As I ventured to point out in *Cecil v. Champions, Ltd.* (1933, O.P.D. at p. 32) a person must take precautions against harm happening to another, if the likelihood of such harm would be realised by the reasonably prudent person. He is not however bound beyond that. He need not take precautions against a mere possibility of harm not amounting to such a likelihood as would be realised by the reasonably prudent person."

The bull case, if I may call it that, was decided very recently (*Maubray v. Syfret*, 1935, A.D. March). The judgment of WESSELS, *C.J.*, deals fully with the facts and the law, and reference will have to be made freely thereto. "The respondent, the defendant in the Court below, is the owner of a farm 'The Springs' in the Salisbury district. Over this farm runs an unfenced public road. The plaintiff is a mining engineer and also a farmer on a fairly large scale and experienced in cattle. On the 21st April of last year the plaintiff, his son Duncan and a native Wilson were driving in a motor car on the road running through 'Springs' when they encountered a herd of cattle belonging to the defendant. The appellant was driving the car. The herd was scattered but there was a proportion of the herd strung out along the crown of the road. The herd was moving in the same direction as the car and was being driven to the cattle dip of the owner, Mr. Syfret. The appellant, Mr. Moubray tells us that he pressed the hooter several times and then he called out to a herd boy in charge of the herd and asked him to move the cattle off the road to allow the car to pass. The boy did not comply with the request but stood and grinned at him. Moubray then got out of the car and so did his native boy Wilson, and between them they drove the cattle off the road. He paid no attention as to whether there was or was not a bull in the herd; he was only concerned with driving the cows off the road. Having done this Moubray walked to the back of the car . . . Whilst there a bull rushed out from among the cows

and tossed the appellant doing him considerable injury. He claimed £500 damages from the defendant .... The learned Judge apparently came to the conclusion thatt he bull was vicious ...., that in consequence the bull should not have been allowed on a public road without adequate control .... He therefore found that the defendant was negligent (1) in allowing a vicious bull to be on the public road running over his farm, and (2) in not providing proper control for such bull whilst on the public road. The learned Judge however, found against the plaintiff on the ground that he contributed to the accident by acting in a rash and imprudent manner. He ought to have scanned the herd and seen whether there was a bull amongst the cows and sought to avoid it.

" The plaintiff's case is based on the negligence of the defendant in having a vicious bull on the public road not under proper control. In order to determine whether the defendant was or was not negligent we must take into account all the surrounding circumstances. It has repeatedly been said in this Court that in order to determine whether in a particular case there was or was not negligence we must take into account all the surrounding circumstances, time, place, custom, local habits, as well as the special and peculiar facts of the case. What you may be able to do in the day-time you may not be able to do at night, and what you can do in the open country you cannot do in a populous town; what is customary in one place may not be customary in another, and so on. The incident occurred on a public unfenced road, running through Syfret's cattle farm in the Salisbury district where it appears from the evidence there are several cattle farms in close proximity to one another. Rhodesia is admittedly a cattle country with large open spaces. *Prima facie* the owner of a farm is entitled to allow his cattle to roam over his farm, so that at times they may be found straying on the public road. In a country where cattle ranching is an important industry, we must see that we do not make it intolerable for the owner by imposing upon him unnecessarily onerous conditions, and we must assume that persons who use public roads running through cattle farms are acquainted with the ordinary conditions appertaining to such farms. In other words, that a person who uses a public road passing over a cattle farm will know that he may encounter cattle on the road, and that there may be bulls among the cattle and if he is a motorist he must act prudently and not disregard the obvious customs and habits of the country. On the other hand the owner of cattle which are apt to stray on to a public road must use reasonable care to see that he does not on his farm expose the travelling public to dangers from his cattle which he ought both to foresee and avoid. An owner of a bull which he knows to be ferocious is not entitled to allow that bull to roam at large over his farm so that it may stray on to a public road which crosses his farm and injure a person lawfully using that road. On the other hand a normal bull which is not ordinarily ferocious may well be allowed to accompany a herd of cows, roam over the farm and so come on the public road. It is not the custom in South Africa and certainly not in Rhodesia, where it is common knowledge that there are huge

ranches through which public roads run, to keep ranch bulls securely locked up. It is the custom of the country for bulls to run with the herd and it would be absurd to require the owners of cattle to have each herd attended by a herd boy to see that they do not come on an unfenced public road on the farm. If in fact it is a negligent act for the owner of a farm to allow normal bulls to stray on an unfenced public road the cattle breeding farmer would have to see that each bull is in charge of a herd boy. This would be an impossible condition to impose on catlle breeders. We may therefore take it that it is not negligent *per se* to allow bulls to roam with herds unattended nor is it a negligent act to drive bulls with the herd on a public road running through the farm to be dipped or for other purposes. Everybody who uses such a public road in Rhodesia must therefore expect to find bulls accompanying herds and must take the necessary precautions to avoid an accident. At the same time a person using a road cannot be expected to wait an indefinite time for a herd to leave the road if there is no herd boy to drive the herd off the road; he may do so himself though if he must do so he must be vigilant and act prudently in driving them off. Even if he is not a catlle farmer, a traveller on such a public road must anticipate that there may be a bull in the herd and he must be expected to know that even tame bulls may at times show vice, for it is well known in this country that you cannot always trust a bull. If he does not know this it is unfortunate for him but it will not excuse his want of due care in driving the cattle off the road. If in such a case an accident should happen and the person who drives the cattle off the road is tossed, it is what our law regards as an accident for which the owner of the bull will not be liable. The above remarks apply to cases where the owner is reasonably entitled to believe that the bull or bulls which accompany the herd are not of such a vicious disposition that an accident may well be expected if the bulls should come into contact with strangers using the public road." (The judgment then proceeds to deal with the evidence on the question firstly whether this particular bull was known to the owner or his manager at the time of the accident to be of such a vicious disposition that he could not be trusted to roam on the farm and so stray upon the public road unless adequately guarded and the decision arrived at is that in the circumstances the plantiff had not discharged the *onus* of proving that the defendant was guilty of negligence and that he ought to have known that the bull was vicious. It was therefore found unnecessary to consider the question of contributory negligence, with the result that the appeal was dismissed with costs.)

Sir ETIENNE DE VILLIERS in a concurring judgment, said:— "I agree that the judgment of the trial court should be sustained on the ground that the respondent neither knew nor ought to know that the bull was vicious .... The question however arises whether, even if the bull was as tame and quiet as the average or ordinary bull, the respondent ought not to have taken precautions in view of the admitted fact that all bulls, for some reason or other, become vicious at times or at moments,

and are then liable to attack unoffending strangers. Now this question is conclusively answered by the recent case of *Wasserman v. Union Government* . . . ."

The dog case is that of *Mehnert v. Morrison* decided by the Transvaal Provincial Division on the 15th March, 1935. The plaintiff in his summons alleged that his wife to whom he is married in community of property, while walking in the township of Rietendale, was attacked and injured by a certain dog or dogs the property of defendant wrongfully and unlawfully allowed to be at large. He accordingly claimed £50 damages, being £2.10.0 damages to her clothing and personal effects and £47.10.0 damages for personal injuries, pain, suffering, and shock.

Various defences were raised but, after evidence had been heard, it was admitted that the plaintiff's wife had been attacked by two dogs, one of which belonged to the defendant and one to a certain Strydom.

The Court came to the conclusion that the case had to be decided on the basis that the exact locality of the attack had not been established by either the plaintiff or by the defendant.

For the plaintiff it was contended firstly that the *onus* was on the defendant to prove that the plaintiff's wife was not lawfully on the place where she was attacked and secondly that even if the *onus* was on the plaintiff it was for the defendant to show that there was some causal connection between the attack and the trespass by the plaintiff's wife, the mere fact of her being on unfenced ground across the street and some distance away from the defendant's house could not in any way be said to be negligence or imprudence on her part or to be unpropriety of conduct on her part which directly caused or mainly contributed to cause the injury.

The judgment of DE WET, *J.*, then proceeds as follows:—" The law on the question of the liability of an owner for damage caused by his dog was fully discussed by the Appellate Division in the case of *O'Callaghan v. Chaplin* (1927, A.D. 310) and the principles applicable were summarised by DE VILLIERS, *C.J.*, in *South African Railways and Harbours v. Edwards* (1930, A.D. 3). In the former case the Court decided that although the *noxae deditio* was not part of our law in South Africa the *actio de pauperie* which gave relief against an owner of a domesticated animal which acted viciously or from inward excitement contrary to the nature of its class was portion of our law. Having come to this conclusion after a very full review of the authorities, INNES, *C. J.* at page 328 proceeds: ' But the liability of an owner must be limited in accordance with the principles of the Civil Law. I agree entirely with the ruling in *Drummond v. Searle* that one of those limitations must be that the injured person, or the injured animal was lawfully at the place where it was injured.' Further on he says: ' I also agree with

LAWRENCE, J. in thinking that there must have been no substantial negligence or imprudence on the part of the person injured — by which I understand no unreasonable conduct contributing to the injury. The basis of that limitation of the owner's liability is to be found in the *Digest.*' After referring to the *Digest* he continues: 'So that there is direct authority for the application in pauperien actions of the fundamental principle that no man can recover damages for an injury for which he has himself to thank.' It is true that he then continues: 'By our law, therefore, the owner of a dog that attacks a person who was lawfully at the place where he was injured, and who neither provoked the attack nor by negligence contributed to his own injury, is liable, as owner, to make good the resulting damage.' It must be borne in mind, however, that the Court was dealing with a case where admittedly the injured child was on the premises of the defendant, and the only question was whether it was lawfully there; the question of *onus* was not considered at all. In dealing with the limitations of the action the learned Chief Justice confirms the phrases 'who was lawfully at the place where he was injured' and 'neither provoked the attack nor by his negligence contributed to his own injury.' In the latter case it was not disputed, and in my opinion rightly so, that the *onus* would be on the defendant to establish provocation or negligence on the part of the plaintiff and it is difficult to see on what principle the *onus* in the former case should be on the plaintiff. It may be argued that the place where the attack is made is a question peculiarly within the knowledge of the plaintiff, but the same would apply to the question whether there had been provocation of the animal by the plaintiff. It is significant that in summarising the principles of the *actio de pauperie* in Edwards' case the then Chief Justice made no reference to the requisite of being lawfully at the place attacked, but states the limitation generally in the following words: 'Dating back as this form of remedy does to the most primitive times, the idea underlying the *actio de pauperie,* an idea which is still at the root of the action, was to render the owner liable only in cases where so to speak the fault lay with the animal. In other words for the owner to be liable, there must be something equivalent to *culpa* in the conduct of the animal. Hence if the fault lies with the injured person himself he cannot recover, as he would have only himself to blame. If for instance he has provoked the animal, or has acted in such a way that the outburst could reasonably have been foreseen.' So also LAWRENCE, *J.*, in the case of *Storey v. Stanner* (1.H.C.G. 40) from which the words quoted by INNES, *C. J.*, are taken, says the following: 'By the ancient and modern civil law, and by the present law of this Colony, the owner of the dog, or other dangerous animal, is responsible for injuries or *pauperies* committed by that animal, irrespective of any question of *scienter* which, however, does not arise in the case before us, provided there is no negligence or improvidence on the part of the person injured; or other impropriety of conduct on his part which directly caused or mainly contributed to cause the injury.' The defendant relied strongly

on the earlier cases of *le Roux v. Fick* (1879 Buch. 29) and *Drummond v. Searle* (1879 Buch. 8) where stress was laid on the fact that the person or animal injured must be lawfully at the place where he or it was injured. In both those cases there was no dispute as to the place where the injury was committed; in the former case, the plaintiff's ostriches were lawfully on the commonage, and in the latter case they were trespassing in the defendant's garden. The question of the *onus* on this point was, therefore, not dealt with by the Court.

" The conclusion to which I have come is that neither in the cases decided by the Appellate Division nor in the authorities there quoted is there any ground for holding that the fact of the plaintiff being lawfully at the place where he was injured is an essential element of *actio de pauperie* which the plaintiff has to establish, but that the limitations on the action laid down by INNES, *C. J.*, namely that the person injured was lawfully at the place where he was injured and that he neither provoked the attack nor by his negligence contributed to his own injury, are matters of defence the burden of establishing which lies upon the defendant. That being the view which I take it is unnecessary to express any opinion on the interesting and weighty arguments addressed to us on the plaintiff's second contention, namely that even if his wife was trespassing on the defendant's ground that would not relieve the defendant from liability under the particular circumstances of this case.

" It follows that inasmuch as on the evidence it was impossible to determine whether the attack on the plaintiff's wife took place while she was still on the footpath on the defendant's ground or in the street, the judgment of the magistrate should have been in favour of the plaintiff.

" The appeal is allowed with costs and the judgment of the magistrate altered to one in favour of the plaintiff for £7.10.0 with costs."

While on the subject, not of *onus* but of " conduct directly causing or mainly contributing to cause the injury " reference might well be made to the case of *Harmse v. Hoffman* (1927, T.P.D. 572). That action arose in the following circumstances:—On the evening of the 4th July, 1926 the plaintiff, who was legally on the premises of the Crown Hotel, Potchefstroom, proceeded to walk from the billiard room of the hotel, through the public bar and thence through the private bar to the lavatory outside. He then returned, intending to go through the private bar and the public bar to the billiard room. As he opened the door of the private bar he trod on a dog belonging to the defendant. As a result the dog gave a yelp whereupon the plaintiff stooped down to stroke or pat the dog, whereupon the dog bit him in his face, giving him an injury. It was held that the plaintiff's injury was caused by his own imprudence in patting the dog after he had trodden on it and not by defendent's act in bringing the dog into a public place, and that the defendant was liable neither

as owner nor on the ground of negligence. In an English case, however, *Gordon v. Mackenzie* (50. S.C.L.R. 64), the Court held that it was not contributory negligence on the plaintiff's part in having stooped down and patted a strange dog in a public street and that he had a good cause of action for damages on account of the dog jumping on him and biting him.

OBITUARY.

We learn from the *Rand Daily Mail* of Febr. 26th, 1935, that Mr. John Donaldson, formerly G.V.O. at Ermelo, died there on the 25th of February.

He was born in Maritzburg in 1877 and was a son of the late Mr. Mark Donaldson, for many years manager of the totalisator for the Johannesburg Turf Club.

He was an old Ermelo resident and a well known member of the Rand Club. He studied at Edinburgh and retired from the service a number of years ago.

Mr. Donaldson was not married.

The International Office for the Protection of Nature.

The Belgian Government has by Royal Decree officially recognized the International Office for the Protection of Nature and has appointed the following delegates to be its representatives to the General Council of the Office :—

Delegates for Belgium : **Baron E. de Cartier de Marchienne,** Belgian Ambassador in London; and

Count Henry Carton de Wiart, former Prime Minister.

Delegates for the Belgian Congo and the Mandated Territory of Ruanda-Urundi :—

P. Charles, Minister of Colonies; and

Professor Dr. V. van Straelen, Director of the Royal Belgian Museum of Natural History and President of the Institute for National Parks in the Belgian Congo.

Jl. S.A.V.M.A.
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The Vermicidal Effects of Spineless Cactus (*Opuntia* sp.)

By G. S. MARÊ, B.Sc., Agric. and O. T. de VILLIERS, M.R.C.V.S.,
Grootfontein School of Agriculture.

In an experiment conducted at Graaff Reinet (Maré and Smith, 1930) a flock of 800 sheep was continuously fed a cactus and lucerne hay ration for some two years. Initially, the animals showed a mild infection of gastro-intestinal parasites, mainly *Haemonchus contortus* and *Oesophagostomum columbianum*. After the work had been in progress for some time it was observed that the infection had decreased and eventually no trace of these parasites could be found. The conclusion arrived at was that the cactus had either acted as an effective vermicide or else that the excessive scouring caused by the cactus ration had resulted in the mechanical clearing out of parasites. The conditions under which the experiment was carried out were such that the chances for reinfection were remote.

In order to gain further knowledge on this point an experiment was carried out at the Grootfontein School of Agriculture, in which one group of animals was fed cactus and another kept as control.

Two groups of ten Blackhead Persian sheep of mixed ages and sex were used in the test. They came from the Bathurst district and were known to be infected with gastro-intestinal parasites. Each group was confined to a small bare paddock, 36 feet by 28 feet, in which shelter and suitable feeding troughs were placed. The animals were fed twice a day, early morning and afternoon. Live weights were recorded once a week after a starvation period of sixteen hours.

The experimental animals, known as group 44, were fed pulped spineless cactus *var. fusicaulis* plus chaffed lucerne hay. This group received no water. The control lot, group 45, was fed chaffed lucerne hay, crushed mealies, and whole oats, and also had free access to fresh, clean water. A daily record of food consumption was kept.

The degree of parasitic infection was determined by means of egg counts, cultures, and post morten. examinations. Counts and cultures were made prior to the commencement of the experiment and again a month and three months later. At intervals during the experiment several sheep were killed for post mortem examination, and at the conclusion all the remaining animals were slaughtered.

At the beginning of the experiment four animals selected from the same flock as the experimental sheep were also killed for post mortem examination. The results are given in Tables 3 and 4. In Tables 1 and 2 are recorded the average individual and group live weights (pounds) of the animals.

TABLE 1. GROUP 44.

Sheep No.	Initial	1st month	2nd month	3rd month	4th month	5th month	6th month
425	48.5	49.0	55.0	56.2	Slaughtered		
426	37.5	35.6	37.5	39.2	,,		
427	42.5	42.2	44.8	45.8	46.4	48.2	48.9
428	41.5	41.8	44.9	47.9	50.5	55.0	57.3
429	34.5	34.6	37.2	41.8	44.6	47.4	48.8
430	32.0	29.8	31.4	35.1	37.0	40.8	41.3
431	38.5	35.8	38.1	39.0	39.6	40.6	42.9
432	41.0	40.2	40.0	40.0	43.3	47.2	49.5
433	32.5	30.8	29.0	26.9	26.9	26.0	25.0
434	45.5	47.1	51.9	54.4	57.5	60.8	63.8
Mean	39.4	38.7	41.0	42.6	43.2	45.7	47.2
Mean excluding No. 433				44.4	45.6	48.6	50.4

TABLE 2. GROUP 45.

Sheep No.	Initial	1st month	2nd month	3rd month	4th month	5th month	6th month
435	43.5	50.0	51.9	52.5	Slaughtered		
436	35.0	35.1	38.8	40.3	,,		
437	40.0	42.4	47.1	48.8	51.1	54.1	55.0
438	39.5	41.8	41.0	36.4	35.4	37.0	40.5
439	32.5	34.2	37.4	38.0	40.6	42.6	43.0
440	35.0	38.0	43.9	47.4	49.5	52.0	54.5
441	40.5	41.9	45.6	49.6	49.6	51.4	53.3
442	38.0	35.0	29.8	Died	—	—	—
443	38.0	38.5	43.0	47.1	49.5	53.1	54.8
444	45.5	48.2	53.2	54.1	56.5	59.8	60.1
Mean	40.0	40.5	43.2	46.0	47.5	50.0	51.6

Group 45 consumed their daily ration of hay and grain consisting of 14 ounces of lucerne, 6 ounces of crushed mealies, and 4 ounces of whole oats. Group 44 consumed 12 ounces of lucerne hay daily and gradually increased their cactus consumption from 2.03 pounds per day each for the first week to 9.20 pounds for the fourth month, after which the consumption again decreased steadily to 6.60 pounds for the sixth month.

In comparing the average live weights of the two groups as reflected in Tables 1 and 2 it will be noted that no significant differences

exist if the exceptionally small animal No. 433 is excluded from group 44. This animal might be taken as corresponding to No. 442 in group 45 which died during the course of the work. When the experiment had been in progress for two months, both had decreased in live weight and scaled only 29 lbs., and it is shown in this paper that both were heavily infested with parasites. Except for these two animals, all the sheep improved in condition amounting in average to 28 per cent.

In Tables 3 and 4 are given the egg counts per gram of fresh faeces taken at intervals as stated above.

TABLE 3.

LOT 44. CACTUS GROUP.

Sheep No.	Initial Count	Count after 4 weeks	Count after 16 weeks
425	2,100	1,200	Slaughtered
246	17,650	3,550	,,
427	16,850	1,300	350
428	6,300	200	700
429	12,950	4,500	950
430	12,250	6,900	6,750
431	1,500	1,150	1,050
432	6,000	1,300	100
433	7,300	5,000	9,650
434	1,500	1,300	550
Mean	8,440	2,640	2,500

Table 4.

LOT 45. CONTROL.

Sheep No.	Initial Count	Count after 4 weeks	Count after 16 weeks
435	950	550	Slaughtered
436	10,950	1,400	,,
437	2,450	1,250	1,250
438	5,000	3,500	6,950
439	7,500	950	600
440	11,900	2,650	2,050
441	25,050	3,500	850
442	16,400	14,200	Died
443	5,800	1,050	1,150
444	2,600	600	800
Mean	8,860	8,965	1,950

Table 5 reflects the degree of infection for the sheep in each group.

TABLE 5.

Degree of Infection	Initial Examination		2nd Examination		3rd Examination	
	Lot 44	Lot 45	Lot 44	Lot 45	Lot 44	Lot 45
Over 2,000 eggs very heavy	9	9	4	4	2	2
Below 2,001 heavy	1	1	5	3	1	2
Below 1,001 medium	0	0	0	3	3	3
Below 501 light	0	0	1	0	1	0
Below 101 very light	0	0	0	0	1	0

The figures in Tables 3, 4 and 5 indicate that at the commencement of the experiment the sheep were severely infected. In both groups nine sheep were classed under "very heavy" infection and egg counts exceeded 8,000 per gram faeces. After four weeks, however, the egg count in both groups had decreased to one third of the original and only four sheep per group were classed as "very heavy" infection. This reduction was no doubt wholly due in respect of group 45, and partly in respect of group 44, to the fact that both groups were confined to bare, hard paddocks in which the conditions for reinfection were most unfavourable.

In Tables 6 and 7 the post mortem findings are recorded in respect of the types of worms observed and the relative degree of infection.

TABLE 6.

LOT 44. CACTUS GROUP.

Sheep No.	O.	Trich.	O.C.	Remarks.
425	*	*	–	Killed two months after commencement of experiment.
246	*	*	–	
427	**	**	*	Killed at conclusion of the experiment.
428	*	*	–	
429	*	*	–	
430	**	**	–	
431	*	*	–	
432	*	*	–	
433	***	**	*	
434	*	*	–	

TABLE 7.

LOT 45. CONTROL.

Sheep No.	O.	Trich.	O.C.	H.C.	Remarks.
435	**	*	**	–	Killed two months after commencement of experiment.
436	*	*	*	–	
437	*	*	–	–	
438	***	*	–	–	
439	*	*	**	–	
440	***	***	**	–	Killed at conclusion of the experiment.
441	*	*	**	–	
443	**	*	**	–	
444	**	*	–	–	
442	**	**	*	–	Died. P.M. negative except for presence of worms.
7	***	***	–	–	
8	***	***	**	*	
14	***	***	–	–	
28	**	**	**	–	

Key to Tables 6 and 7 :—

O. = *Ostertagia.*
Trich = *Trichostrongylus.*
O.C. = *Oesophagostomum columbianum.*
H.C. = *Haemonchus contortus.*
* = Light Infection.
** = Medium Infection.
*** = Heavy Infection.

In Table 7 are included the post mortem findings of four animals killed prior to the commencement of the experiment. They were from the same flock as the experimental sheep.

The results from these four sheep confirm the data given in Tables 3 and 4 in respect of the heavy parasitic infection of the animals at the commencement of the experiment.

In Table 8 is given a summary of the cultures. The figures represent percentages.

TABLE 8.

	Initial Examination.			After 4 weeks.			After 16 weeks.		
	Trich	O.C.	H.C.	Trich	O.C.	H.C.	Trich	O.C.	H.C.
Lot 44	72	27	1	82	19	1	100	0	0
Lot 45	54	44	2	68	31	1	99	1	0

Trich. = *Trichostrongylus.*
O.C. = *Oesophagostomum columbianum.*
H.C. = *Haemonchus contortus.*

The cultures were unfortunately very poor but the results obtained are in close agreement with the post mortem findings as given in Tables 6 and 7 except for the fact that the *Ostetagia* was not differentiated from *Trichostrongylus*. In both groups, *Trichostrongylus* figures largely in the cultures, followed by nodular worm while only a few wireworms were observed. Similarly in the post-mortem findings *Trichostrongylus* was much more numerous than nodular worm while no wireworms were observed. The absence of wireworms is explained by the fact that the sheep were regularly dosed at Bathurst prior to the commencement of the experiment.

Discussion.

It is quite clear that in both groups of sheep the parasitic infection diminished considerably during the course of the experiment. As already suggested this was largely due to conditions unfavourable for reinfection. The result of this diminished infection was an improvement in the general health of the animals. They responded in live weight and increased to the extent of 28 per cent. It is of importance to note that the three animals which showed large egg counts at the third examination (Tables 3 and 4) and proved to be heavily infested on post mortem examination were the worst sufferers clinically. Thus, sheep No. 433 had lost 18 per cent. in live weight at the end of four months; sheep No. 438 had lost 10 per cent, while sheep No. 430 had gained only 16 per cent., as compared with a 28 per cent. gain for the group. Sheep No. 442 which died after two months also declined rapidly in live weight and at death proved to be heavily infested with parasites.

A cursory examination of the figures in Tables 3 and 4 would tend to prove that after 16 weeks the infection was heavier in the cactus fed group than in the controls, the respective average egg counts being 2,500 and 1,950. A more critical observation would lead to an opposite conclusion. In both groups one animal showed a very heavy infection, viz., No. 430 in group 44 and No. 438 in group 45. Over and above this, sheep No. 433 in group 44 was particularly badly infested. In fact 48 per cent. of eggs found in this group, came from the one sheep. As previously pointed out this animal may be compared with sheep No. 442 in group 45, which died previous to the third egg count. By excluding No. 433 from the group the average count is reduced to 1,494, a figure appreciably below the average of 1,950 for group 45.

Comparing the two groups from the point of degree of infection (Table 5) it is found that in group 44 two sheep were lightly infected, three medium, one heavily, and two very heavily; similarly in group 45, three medium, two heavily and two very heavily. On the whole, therefore, the animals in group 45 were somewhat more severely infected at the end of 16 weeks than those in group 44.

Post mortem findings confirm this contention, and at the same time serve to clarify the position.

Referring to Tables 6 and 7, it will be observed that in respect of the *Ostertagia-Trichostrongylus* infection there was little difference between the two groups. In respect of the *Oesophagostomum columbianum* infection the difference is most significant. In group 44 this parasite was found in two sheep only. In group 45, five animals carried a fairly heavy infection and in two others the parasite was present. It can thus be accepted that the cactus reduced the *Oesophagostumum* infection, but had no effect on the other parasites. Since the cactus caused the animals to scour excessively and since the *oesophacostomes* occur so far posteriorly in the alimentary canal it is reasonable to presume that they were eliminated mechanically and not as a result of any direct vermicidal effect of the cactus.

Summary and Conclusions.

(1) A sheep feeding experiment is described in which the vermicidal effect of cactus *Opuntia ficus* variety *fusicaulis* was tested.

(2) Two groups of ten animals each, heavily infested with internal parasites, were used. One group was fed pulped cactus and hay, the controls hay and grain only.

(3) *Ostertagia, Trichostrongylus, Oesophagostomum columbianum* and *Haemonchus contortus* were present initially.

(4) After one month the infection had decreased considerably mainly due to conditions unfavourable for reinfection.

(5) At the conclusion of the experiment the general infection was somewhat heavier in the control group.

(6) The difference in the degree of infection of the two groups was mainly in respect of *Oesophagostomum columbianum.*

(7) It is concluded that excessive scouring in the cactus group served to eliminate this parasite mechanically by virtue of its posterior occurrence in the alimentary canal.

(8) Cactus has no vermicidal effect on worms.

Before concluding this paper the authors wish to express their gratitude to Drs. Mönnig and Ortlepp for their valuable assistance in respect of the data on egg counts and cultures.

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Goitre in Afrikander Calves.

By A. MATTHEW, M.R.C.V.S., East London and A. D. THOMAS, D.V.Sc., Onderstepoort.

Introduction.

From a perusal of available literature one obtains the impression that goitre of domestic animals is practically unknown in South Africa. Quinlan (1928), in a survey of the endocrine glands of bovines undertaken for sterility studies, was the first to draw attention to the relatively high percentage (6 out of 60 animals examined) of noticeable changes in this gland (*struma colloides*): He was unable, however, to trace the origin of these animals, which he states were of the Afrikander type.

The following observations, although very superficial and incomplete, will serve to place on record the occurrence of goitre in a herd of pure bred Afrikander cattle in the Middle Eastern Cape Province. The fact that our own indigenous breed of cattle, otherwise regarded as resistant to the numerous ills common to this country, is primarily involved raises a point of more than passing interest.

Owner's Observations.

According to the owner, the disease has made its appearance in his **calves** only since the severe drought experienced in 1927-28. He had one case in 1929, six in 1932, two in 1933, and three in 1934. These "swollen throats," as he calls them, developed rapidly within a couple of weeks from birth, and remained thus enlarged usually until the animals were two or three years old, in some being noticeable even at 5 years of age. Two calves at least are definitely stated to have been born with the condition. The swelling usually reaches the size of a man's fist on either side of the neck, but in one calf six months old it attained the size of a "small football." The swellings are firm, and apparently remain more or less unaltered as the calves grow up. The owner was not a little puzzled to see that the affected calves fed and drank normally and did not show the discomfort that might be expected from similar inflammatory swellings. In one case, however, he reports that breathing was interfered with, presumably by pressure on the trachea. All affected calves are stated to be backward and do not appear to thrive as they should.

He also noticed that the affected calves were all from a certain bull or from another closely related to it, and this led him to suggest that the condition might be hereditary.

Early in 1934 the owner began taking a serious view of the occurrence and got into touch with the Veterinary Department. A visit to his farm by one of us (A.M.) was arranged in April of that year, and resulted in a clinical diagnosis of goitre being made. The farmer was induced to send one of the least valuable of the affected calves to Onderstepoort for further examination.

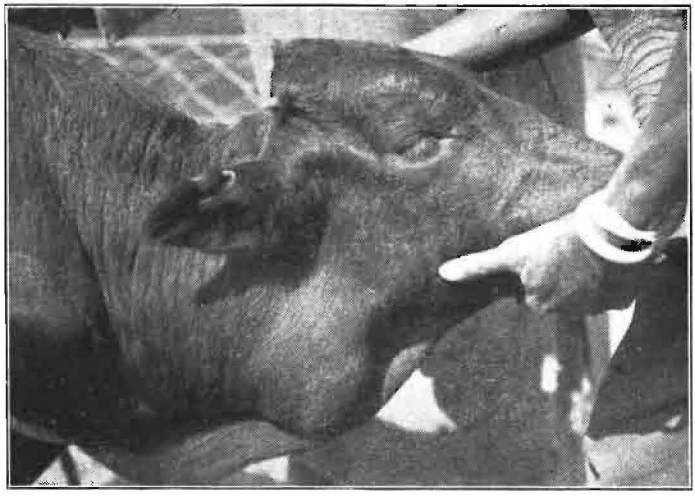

FIG. 14. Africander calf with goitre.

Beyond the fact that this herd has been grazing on sour mountain veld, the cows being transferred to old lands before calving and getting a small ration of " Lixall," no precise information is available regarding the diet and water supply of these animals. Unfortunately, it has not been possible to carry out any chemical analyses on the pasture and water in this locality.

From enquiries made, it would seem that such goitrous swellings have not been noticed in other animals on this farm nor in bovines in the neighbourhood, although this farmer maintains that he has seen it in a herd in another district. Hairlessness was not observed in any of the affected calves and only in one instance was contraction of the flexor tendons noted.

Potassium iodide was prescribed for the calves at first in massive doses and later in the form of a lick, but to date little if any beneficial results are noticeable.

On the calf sent to Onderstepoort and said to be typical of the others affected in this herd, the following observations were made :—

Clinical and Post Mortem Examination.

The subject, a Red Afrikander heifer calf about nine months old was in fair condition. In the region of the throat was a large rounded, firm swelling about 15 cm. across extending from the angle of the *ramus* half way down the neck. The skin in this region was very thick but freely moveable over the swelling. Apart from the above abnormality, the animal looked quite healthy, took food, and behaved in a normal manner. The calf was destroyed for autopsy by chloroform inhalation.

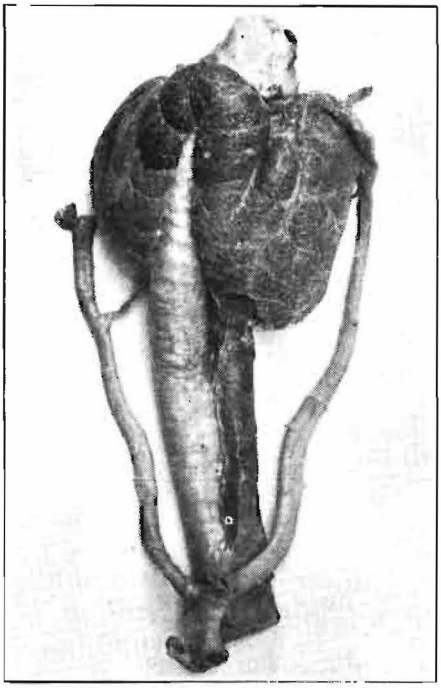

FiG. 15. The thyroid gland of animal depicted in fig. 14 dissected out to show size of arteries of supply and compression of trachea.

The fresh thyroid had the following dimensions : right lobe 13 x 6.5 x 5 cm., left lobe 11 x 6 x 5 cm. The isthmus was horseshoe-shaped and about 3 cm. wide x 1.5 cm. thick.

The gland was supplied on either side by large arterial branches from the carotid (see fig. 15) and presented a firm, distinctly lobulated appearance owing to the strong fibrous interstitial tissue development. The parenchyma had a light pinkish-brown colour and solid appearance instead of the usual finely, spongy texture. No colloid matter could be expressed from the substance of the gland. The thymus and other endocrines were apparently normal.

The trachea as it passed between the lobes was distinctly compressed laterally. No other lesion of significance could be noted in the rest of the carcase except a few intestinal worm nodules.

Histological Appearance.

The histological preparations showed enlarged, irregular acini in localised patches, some of which contained a greater or lesser amount of thin, almost non-eosinophilic colloid. The greater part of the gland, however, was composed of collapsed or compressed papilliform acini with restricted lumina in which little or no colloid could be seen. The epithelial cells lining the acini were greatly elongated to the point of being cylindrical. The interstitial fibrous tissue was very prominent, forming a strong and dense network between the acini and thicker strands between the lobules.

In other words the histological appearance is typical of a *struma diffusa parenchymatosa.*

Discussion and Conclusion.

The information at our disposal and our own cursory examination does not enable us to come to any conclusion as regards the precise significance of this particular type of goitre.

On the meaning of thyroid changes such as these the literature is not very clear, nor is the controversial question of iodine deficiency as the aetiological factor particularly helpful.

The occurrence of endemic goitre in human beings has been recognised of late years in parts of the Eastern Cape Province (Langkloof Valley), but no survey has as yet been undertaken to determine whether animals, both domestic and wild, in this locality show any tendency to goitre formation *. In his iodine determinations on various vegetable substances in this country, Blom (1934) was unable to establish a definite iodine deficiency in vegetable substances in this locality.

It should also be remembered that thyroid enlargement as an hereditary condition is described in text-books, and with the present history of this herd should probably be taken into account as an aetiological factor.

Very little importance can thus be attached to the fact that the condition has hitherto not attracted more attention, since Quinlan's single observation has revealed unsuspected variations in the size and substance of thyroids even if not all clinical goitres.

Whatever the cause, we are faced with the fact that the disease in this form assumes a definite pathological and economic importance.

* Dr. Schur Brown of Joubertina informs us that he has not yet encountered it in animals, although he has several affected families (whites) under observation.

It is probably true that only a small percentage of calves die at birth or shortly after as a direct or indirect result of goitre (parturition accidents, respiratory obstruction, contracted tendons, and other complications). The greater loss, however, is a drop in the market value of affected animals, especially stud cattle, by reason of their relatively unthrifty appearance and possible disfigurement due to the enlarged gland. This breeder, for instance, is particularly perturbed by this latter defect and afraid of acquiring a reputation for breeding this "weakness" into his stock.

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Cornu Cutaneum on the Forehead of an Ox.

By M. H. V. BROWN, B.V.Sc., Onderstepoort.

The specimen described here was received from the Johannesburg abattoirs on 6/3/1935. It consisted of the head of an aged blue-grey ox with the horns sawn off and with a large horny mass hanging from the forehead.

As can be seen in the accompanying photograph (Fig. 16) a large pendulous horny structure was attached to the skin of the forehead just to the left of the median line and slightly above the level of the orbital crest. The left eye was almost completely obscured by the growth which reached down to the left nostril. In shape it was roughly cylindrical with the tip somewhat bifid. The total length of the appendage from attachment to tip was 30 cms. and it was slightly broader at the tip than at the attachment, the respective diameters being 14 and 12 cms., the mass gradually broadening from the proximal to the distal end.

The growth consisted for the first 4 cms. from its base of soft thick skin covered with hair. In this part a firm cord could be felt in the centre of the stalk. The skin then became scurfy, hairless and hard and for the distal two thirds of its length (ca. 20 cms.) the growth consisted of thick, hard, scaly horn with an irregularly foliate surface.

The whole mass was perfectly loose and could be moved with ease from side to side. When lifted up to a position at right angles to the frontal bones the left eye could be seen to be entirely unaffected. One small cicatrix (ca. 1 cm. in length) was present in the skin over the nasal bones; this was probably a healed abrasion which had been caused by the horny structure. For the rest the skin under the growth was unchanged.

On skinning the mass off, it was found to be attached to the frontal region by thick soft skin continuous with the skin of the head, and by a central cord (which was previously felt through the skin) of firm translucent yellow tissue. The skull was flayed and macerated and the frontal bones examined for any abnormalities, but none were found, their surface at the point where the growth was attached to the skin being perfectly smooth and presenting a normal appearance.

Sections for histological examination were cut from the central firm core and from the growth at various parts of its length. The central core consisted almost entirely of ripe connective tissue fibres closely packed and forming a dense tissue. A small amount of fat was also present.

The sections of the first third of the growth showed normal squamous stratified epithelium with no evidence of neoplastic proliferation. The spinous cells were heavily laden with dark pigment granules. In further sections from the horny part the same picture was seen except that the surface of the epithelium was covered with a thick deposit

FIG. 16. An unusual *cornu cutaneum* in an ox.

of horn which appeared to have been normally formed in every respect. No sections were cut from the distal third of the growth as this consisted entirely of dense, hard horn.

On the macroscopic and microscopic appearances of this specimen a diagnosis of *cornu cutan um* was made. Unfortunately no history of any kind could be obtained, with the result that no information can be given as to the origin of this aberrant growth of horn, although several possibilities exist. It may have resulted from a horn "rest" embryologically misplaced. Its location on the skin of the forehead not very far removed from the normal horns supports this theory to some extent.

It is interesting to note also that horny growths somewhat similar to this one have been described as occurring as a result of traumatic irritation in this region. Martinaglia (1) and Purchase (2) both describe

(1) Martinaglia, G. (1932). Keratosis of the Skin in Cattle, *Jl S.A.V.M.A.* III, 3, pp. 138—141.

(2) Purchase, H. S. (1935). Some Native Methods used in Cattle Husbandry in Barotseland, *Vet. Rec.* XV, 2, pp. 27—28.

keratinised outgrowths on the muzzles of cattle in South Africa. The latter draws attention to the fact that these "rhinoceros-like horns are caused by a form of mutilation practised by the natives of Barotseland on calves to prevent them from suckling. A comparatively large area of skin is partly peeled off the muzzle and allowed to hang downwards and forwards, sometimes over the mouth and nostrils. The raw area left is frequently rubbed with ashes to prevent it healing and chronic irritation is thus set up."

These cases, however, can probably be styled cutaneous keratosis in distinction to the true spontaneous *cornu cutaneum*.

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Acacipetalin, a New Cyanogenetic Glucoside from South African species of *Acacia*. Its isolation from *Acacia Stolonifera* Burch. and Chemical Composition.

By CLAUDE RIMINGTON, M.A., Ph.D., B.Sc.; A.I.C.,
Empire Marketing Board Fellow, Onderstepoort.

Steyn (1934) recently called attention to the danger of feeding certain *Acacia* species, especially the ground-up pods of the Transvaal and Natal camel-thorns, *Acacia giraffae* and *Acacia lasiopetala,* on account of the fact that these materials contain considerable quantities of prussic acid. Quantitative determinations of the prussic acid content of various *Acacia* species are to be found in the article by Steyn and Rimington (1935).

Reference was also made in this Journal (Rimington, 1934) to the isolation of the *Acacipetalin* and shown to be responsible for the formation of prussic acid.

Acacipetalin crystallises in colourless six-sided prisms (see Fig. 17) with M.P. 176-7° and $[\alpha]_D^{26}$ -26.3°. It is readily hydrolysed by emulsin with liberation of hydrogen cyanide.

Tetra-acetylacacipetalin crystallises in long flattened prisms with M.P. 104° and $[\alpha]_D^{26}$ -16.2°. It is not hydrolysed by emulsin.

Analyses of the glucoside corresponded most nearly with the formula $C_{11}H_{17}O_6N$ which was confirmed as the molecular formula by cryoscopic molecular weight determination (Found 258.6; 248.3. Calculated 259). Methoxyl groups were absent. Hydrolysis by emulsin or dilute acid yielded 1 molecule of glucose, identified qualitatively and quantitatively, and 1 molecule of hydrogen cyanide.

By calculation, therefore, the aglucone must be an unsaturated compound of the formula C_4H_6O. The possibility of its being C_4H_8O, normal or isobutyraldehyde or methylethyl ketone was definitely excluded since these substances could not be detected among the degradation products.

Enzymic hydrolysis (emulsin at 37°) formed hydrogen cyanide, glucose, acetone in small quantity, and acidic substances. Acetone was identified as the 2:4 dinitrophenylhydrazone and p-nitrophenylhydrazone. Hydrolysis by 2 per cent sulphuric acid at boiling temperature liberated hydrogen cyanide, glucose, and isobutyric acid, the latter being converted into its sodium salt (equivalent found 86) and identified as the p-toluide.

Boiling with saturated baryta liberated ammonia, identified as the chloroplatinate, and after subsequently refluxing with acid there was isolated from the mixture glucose (in 77 per cent yield of theory) and an acid yielding a 2:4 dinitrophenylhydrazone crystallising in orange-yellow prisms of M.P. 190°, soluble in sodium carbonate solution but reprecipitated in the crystalline condition on acidification. Analysis indicated

that the parent substance was a ketonic or aldehydic acid $C_5H_8O_3$. Of the various isomeric possibilities, that which seemed most probable was isobutyrylformic acid $(CH_3)_2$. CHCO-COOH. This material was synthesised according to the literature and its 2 : 4 dinitrophenylhydrazone (M.P. 190°) proved to be identical with that derived from the glucoside. Upon the basis of these observations the following structural formula is proposed for acacipetalin : —

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix} > C = C < \begin{matrix} CN \\ O\text{-}C_6H_{11}O_5 \end{matrix}$$

Hydrolysis and the removal of hydrogen cyanide would yield dimethylketene which is known to react with water to form isobutyric acid. The

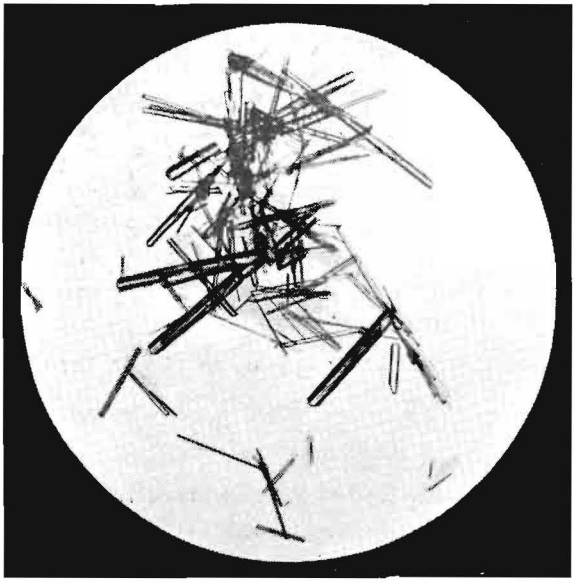

FIG. 17. Acacipetalin crystallised from alcohol : ether. × 65.

production of ketones from ketenes has also been observed under certain conditions (compare Hurd and Dull, 1932). Alkaline hydrolysis, on the other hand, would first of all convert this structure into

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix} > C = C < \begin{matrix} COOH \\ O\text{-}C_6H_{11}O_5 \end{matrix}$$

which on boiling with acid would be resolved into glucose and the enol form of isobutyrylformic acid

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix} > C = \underset{\displaystyle OH}{\overset{\displaystyle |}{C}}\text{-}COOH$$

Attempts to convert acacipetalin into a dihydro derivative by catalytic reduction using colloidal palladium and hydrogen were not successful since the greater part of the glucoside suffered more deep-seated changes. A fairly slow but continuous uptake of hydrogen was observed and in the reaction mixture were detected acetone (isolated as 2:4 dinitrophenylhydrazone), substances giving primary amino reactions (from the reduction of the -CN grouping), and isobutyl alcohol, derived undoubtedly from isobutyraldehyde.

With regard to the possible mode of origin of acacipetalin in the plant, the suggestion may be ventured that acetone, formaldehyde or its cyanhydrin, and glucose would form not unlikely starting materials—

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!CO + H_2C\!<\!\begin{matrix} CN \\ OH \end{matrix} + C_6H_{12}O_6$$

$$\downarrow$$

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!C=C\!<\!\begin{matrix} CN \\ O\text{-}C_6H_{11}O_5 \end{matrix}$$

From two Australian *Acacia* species, *A. glaucescens,* and *A. cheeli,* Finnemore and Cox (1930) isolated sambunigrin, a benzaldehydecyanhydrin glucose ether bearing no resemblance, chemically, to acacipetalin. It is of interest in this connection that the S. African species of *Acacia* belong to a different group in the genus, bearing true leaves, whereas the two Australian species are phyllodineous.

A full account of this work will appear shortly in the *Onderstepoort Journal,* published from this laboratory.

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THE ASSOCIATION.

Presidential Address delivered by Mr. F. J. Carless, at the General Meeting held at the Agricultural Show Grounds, Johannesburg, on 18th April, 1935.

I must apologise for having no written address to present to the Meeting, but would like to make a few remarks concerning the year's work.

The activities of the Council have already been outlined by the Secretary. Five Council Meetings were held during the year, and all were well attended.

One of the most important points under consideration was the question of reciprocity of South African graduates with the Royal College of Veterinary Surgeons. Matters have now proceeded to the point where a South African graduate can be appointed with the sanction of the Governor-General of a British Colony. Memoranda are still passing between various authorities in this connection, and the matter is at last being taken seriously.

During the year I have found collaboration between the S.A.V.M.A. Council and the Veterinary Board most satisfactory, and it is to be hoped that the Board will meet more frequently this year.

Another important matter under consideration is the position of the private practitioner in this country. The whole matter of free State veterinary services should be investigated with a view to improving the lot of the private practitioner. The State is in a difficult position in that free veterinary services have been given to farmers for many years, and it will be very difficult to take this away from the agriculturist at the present juncture. A possible way out of the difficult might be to let the Government Veterinary Officer attend to scheduled diseases and leave non-scheduled conditions to the private practitioner. An important aspect of veterinary practice in this country is that very few practitioners make their living out of pure private practice. Most have part-time appointments or retaining fees from Municipal or other bodies, and have in fact been driven to this by the paucity of their practice.

I fully agree with the Secretary's suggestion that efforts be made to have a State Commission appointed representative of the Department, the S.A.V.M.A., the Veterinary Faculty, and possibly the Agricultural Unions, to review the whole position of veterinary services in South Africa.

I am sure that I have the support of all private practitioners in expressing my appreciation of the research work performed at Onderstepoort during the past year. The successful evolution of a vaccine for horsesickness is an outstanding advance, and I hope it will have the effect of bringing the horse back to its rightful position and replacing motor transport.

Dr. Steyn's painstaking work on poisonous plants is, too, much appreciated by the farmers.

In the field progress is no doubt being made in controlling dangerous diseases. I understand that there has been a slight increase in sheep scab, which is a serious menace to South African industry, but doubtless, the field service has the position well in hand. In the control of scab the farmer's support is usually forthcoming, and this much lessens the difficulties in eradicating the disease. I am sure we will see the end of scab in South Africa before many years have passed.

In connection with East Coast Fever, I must say that I am very concerned about the present position. It appears to me that we are losing ground in controlling this disease. There appears to be great danger that the disease is becoming endemic in this country. Strenuous efforts should be made to prevent this, if possible, as this would represent a definite retrogression. As the Government has perhaps more money this year than it has had previously, I should advocate that the " slaughtering out" policy be exercised wherever possible in the eradication of East Coast Fever. There is no doubt that this would raise many difficulties in Native areas, but it appears to me that such a system would be the only way of wiping out this disease.

In conclusion, I should like to thank the Secretary and Council for the able assistance they have given me in the conduct of the Association's work during the year. Various Committees and the Assistant Secretary have been particularly helpful.

As a final word, I must express my pleasure at seeing Sir Arnold Theiler once more amongst us. I hope that he will remain in our midst for a considerable time and will take an active part in the affairs of the Association.

Minutes of Meeting of Council held at the Grand National Hotel, Johannesburg, on 22nd March, 1935, at 5.15 p.m.

Attendance : Mr. F. J. Carless (in the Chair), Dr. H. H. Curson, Dr. P. J. Fourie (Hon. Secr.-Treas.), Dr. D. G. Steyn, Messrs. C. J. van Heerden, C. Jackson, A. C. Kirkpatrick, G. Martinaglia, Dr. A. D. Thomas and Mr. M. H. V. Brown.

1. **Confirmation.** The minutes of Meeting of Council held on 3rd December, 1934, were taken as read and confirmed.

2. **Matters arising out of these minutes.**

(a) *Status Committee's Report — Part-time Appointments.* The Secretary read a letter addressed to the Secretary for Agriculture and Forestry, in which it was suggested that as a trial a few districts should be selected, where one or other of two alternative schemes could be tried:

(i) The Government Veterinary Officer to do private and municipal work in addition to his ordinary official work and fees received for private and municipal work to be paid into revenue.

(ii) Part-time appointments, the Government to pay a retaining fee (£400 p.a.) whilst for private and municipal work the veterinarian makes his own arrangements.

In reply the Secretary for Agriculture stated that particularly in view of shortage of staff it was not practicable to introduce any of these schemes at the moment.

Certain other matters raised by the Department had not yet been fully cleared up and the Secretary was instructed to again approach the Department concerning these.

Mr. van Heerden pointed out that a serious problem at the moment was staff shortage, and that the Department was seriously considering the closing down of several districts. He suggested that the first step which should be taken would be to raise the fees charged by Government Veterinary Officers for work on non-sporadic diseases. This would educate the public up to paying something for veterinary services. A definite scale of fees could even be drawn up for such Government work.

It was suggested that Mr. van Heerden should explore the possibilities of doing this departmentally and report at a later council meeting.

(b) *Sera and Vaccines.* In connection with the 20 per cent. duty charged on imported laboratory products, Mr. Carless said that he had made enquiries from the Customs Tariff Commission at Port Elizabeth, but considered that there was no hope of getting the duty decreased on account of strong medical opposition, and had accordingly abandoned the idea.

The Secretary said that this statement re-opened the whole question of supplying drugs to laymen. He quoted as an example the fact that attempts had been made to withhold Akiron (a useful drug in piroplasmosis) from laymen with the co-operation of the agents in South Africa.

It was now time to determine whether such a rule should be enforced on all such products. He also felt that the time had now arrived to go carefully into the question as to whether it was in the interests of the farming community to develop further a State Veterinary Service at the expense of the private practitioner or to encourage the private practitioner at the expense of the State Service. In raising this question he did not think only of the interests of the farmer, but also of the graduates who were being turned out every year by the Pretoria University. He had always been an ardent protagonist of the private practitioner, but he felt that one could not ignore the world movement towards state services, and in deciding on a national policy, he thought that primarily the interests of the farming community should be borne in mind. He suggested that some representative body should go carefully into the whole question and that the Department of Agriculture be consulted. He felt that representatives of the Department, the Veterinary Faculty, the private practitioners and several members of some national agricultural unions, would be best qualified to report on the matter.

Dr. Steyn suggested that the Secretary for Agriculture and Forestry be asked to appoint a commission to investigate the question.

The Secretary suggested that the President should approach the Secretary for Agriculture and Forestry and ask him if and when such a commission could be appointed; and in addition he would write to the Secretary for Agriculture and Forestry and enquire on the same subject.

(c) *Scales of Pay recommended by the Pro-technical Section Public Servants Association.*

The Secretary said that in reply to letters written to the Medical and Law societies letters had been received intimating that they were considering the matter with a view to concerted action. Dr. Curson pointed out that it was very likely that the recommended scheme would be adopted.

Mr. van Heerden proposed that Drs. A. D. Thomas and H. H. Curson act as our representatives in dealing with this matter. This was agreed to.

(d) *Scales of Charges for Professional Services.*

The Secretary said that Messrs. Horwitz and Cameron-Dow of Port Elizabeth and Cape Town respectively had both written asking whether a scale existed for the guidance of private practitioners.

It was agreed that the status committee be asked to draw up a scale of charges, and that for this purpose another private practitioner should be co-opted by the committee.

(e) *Dr. Schulz.* The Secretary stated that he had received a letter from Dr. Schulz, in which the latter intimated that he thought he would receive better treatment overseas, and enquired the Department's view of this question. Dr. Curson stated that he had discussed this matter with Dr. de Kock, and learned that the Department was very sympathetic towards Dr. Schulz, and that a first operation now necessary would be done in Cape Town at government expense. He did not learn anything about the further possibilities. The Secretary was instructed to write to Dr. Schulz and inform him of this.

3. **Letter Mr. M. C. Robinson.** The Secretary read the letter which embodied a complaint re articles in a prominent newspaper, apparently written by a layman, recommending a fatal dose of strychnine as a tonic for a dog, and further giving details of biliary fever immunization. It was agreed that the Secretary should write to Mr. Robinson to make sure that the writer in the newspaper was a layman and, if so, point out to the paper the extreme undesirability of accepting such articles from laymen.

4. **General.**

(a) *New Members.* The Secretary proposed that Messrs. N. Barrie, A. R. Thiel, W. J. Wheeler, J. G. v. d. Wath, B. Young, J. H. N. Hobday, C. Dawe and Miss Vera Amos be approved for election as members. This was agreed to.

(b) *Resignation* — A. Grist. This resignation was considered, and it was agreed to place it before the General Meeting.

(c) *Veterinary Board* — 1935 Election. The Secretary announced that Dr. Curson had been re-elected to the Veterinary Board.

(d) *New Council.* The Secretary announced that there was a tie for the eighth place in the New Council, Dr. D. G. Steyn and Mr. C. Jackson having received an equal number of votes. Mr. Jackson, in view of the position, asked to be allowed to withdraw his candidature. This was accepted and Dr. Steyn was declared elected.

In connection with the counting of votes for the New Council, Dr. Thomas asked if a member of Council was present besides the Secretary and if not, objected to the method of counting the votes while pointing out that constitutionally one member of Council should have been present.
The Secretary stated that he did ask a member of Council to be present, but the latter refused, as he stated he was concerned in the ballot. The Secretary was eventually assisted by an independent member of the Association as well as by the Assistant Secretary.

After some discussion Dr. Thomas proposed that the action of the Secretary be condoned. Seconded by Dr. Martinaglia and passed.

(e) *Letter Mr. B. Runciman.* The Secretary read a letter from this member concerning articles appearing in a prominent newspaper in which the name of a veterinarian is mentioned in connection with work he performed.

It was agreed that this matter be referred to the Veterinary Board, and that also the newspapers concerned and the Press Association be informed that such practices were undesirable, and further that the Secretary should write to the veterinarian concerned, requesting him to do all in his power to prevent a recurrence of the type of thing complained of.

(f) *Proceedings — South African Veterinary Board.* Dr. Thomas pointed out that the proceedings of the English and Australian equivalents of the Veterinary Board were published, and asked if the proceedings of the South African Veterinary Board could also be made public.

It was agreed that the Secretary should write to the Board and ask if this could be done, and that a suitable medium for publishing the proceedings would be the S.A.V.M.A. Journal.

(g) *S.A. Health Conference 1936.* The Secretary said that he had received a letter from the Executive asking if veterinarians would take part in the 1936 Conference.

It was agreed that prominent veterinarians be asked to read papers at the 1936 Health Conference.

(h) *Letter — B. M. Horwitz.* The Secretary read the letter in which Mr. Horwitz complained of unsatisfactory rates of pay for professional services paid by the S.A.R. Port Elizabeth, and asking if some standing rate could not be arrived at. It was suggested that the S.A.R. be approached and asked if they would not employ veterinary surgeons at fixed rates of remuneration, and the matter was referred to the Status Committee for action.

(i) *S. & T. Rates: Govt. Veterinary Officers.* Dr. Thomas said that he had received a letter from a member again complaining of S. & T. rates.

Mr. van Heerden said that the matter was being considered and that the first step was to persuade the Public Service Commission to de-proclaim Government Veterinary Officers as District Travelling Officers. Once this was done S. & T. rates

paid to Government Veterinary Officers would be adjusted on a more satisfactory basis.

In this connection the Secretary was instructed to write to the Public Servants' Association and point out these disabilities and enquire whether something could not be done through that Association.

(j) *Articles on Professional Matters by Laymen.* The Secretary drew attention to an article on castration of sheep which appeared in the Departmental Journal "Farming in South Africa", in which methods of doubtful value were recommended by a layman.

It was agreed that the Director of Veterinary Services be approached and asked to prevent such articles appearing.

(k) *Capt. Clapham.* Dr. Curson pointed out that nothing had as yet been done in this connection.

It was agreed that the Secretary should again remind the sub-committee (consisting of Drs. du Toit and Quinlan) that some action was expected in the matter.

(l) *Protection of Badges Bill.* Dr. Curson mentioned that Col. Stallard's Bill for the Protection of Badges and Coats of Arms had been passed by the House of Assembly, and asked that the Secretary write to the Minister for Interior when necessary and claim protection for the S.A.V.M.A. Coat of Arms. This was agreed to.

(m) *Folio Case* for use of Secretary. Dr. Fourie's action in buying a folio case for the Secretary's use was approved.

The meeting then terminated at 8.30 p.m.

Minutes of 28th General Meeting held at the Agricultural Show Grounds, Johannesburg, on 18th April, 1935, at 2 p.m.

Attendance. Present: Mr. F. J. Carless (in the Chair), P. J. J. Fourie (Hon. Sec.-Treas), R. du Toit, P. J. du Toit, Sir A. Theiler, W. B. Allchurch, H. H. Curson, A. C. Kirkpatrick, G. Martinaglia, W. A. Elder, B. Runciman, B. Young, W. A. Chase, A. McNae, F. C. Gavin, R. A. Alexander, R. B. Osrin, J. H. Mason, B. S. Parkin, I. P. Marais, J. I. Quin, J. G. Bekker, W. O. Neitz, H. Graf, W. S. B. Clapham, P. S. Snyman, E. M. Robinson, and M. H. V. Brown.

1. **Confirmation of Minutes.** The minutes of the 27th General Meeting were taken as read and confirmed.

2. **Matters arising out of these minutes :—**

(a) Dr. Curson asked that the Secretary indicate to the meeting Dr. Schulz's present position.

The Secretary said that the Department was taking a very sympathetic view towards Dr. Schulz, and that the first operation to be performed in Cape Town would be paid for by the Government. As to further treatment he did not have any information.

(b) Dr. Curson asked the Secretary whether any change had been made in the Subsistence and Transport rates paid to Government Veterinary Officers. The Secretary replied that the matter was under consideration and that there was every hope of an improvement being made in the near future.

(c) Dr. Curson asked what had happened to the three resolutions passed at the last General Meeting. The Secretary stated that they had been forwarded to the proper quarters, and that in some cases action had been taken.

3. **New Members.** The Secretary nominated the following candidates and proposed that they be elected members of the Association :—

Messrs. J. G. v. d. Wath, B.V.Sc.
A. R. Thiel, B.V.Sc.
W. J. Wheeler, B.V.Sc.
N. Barrie, B.V.Sc.
B. Young, Registered Practitioner.
Miss V. Amos, M.R.C.V.S.
J. Hobday, M.R.C.V.S.
J. Dawe, M.R.C.V.S.

This was seconded by Dr. Curson, and the above persons were duly elected members.

4. **New Office Bearers.** The Secretary announced that Dr. H. H. Curson had been re-elected as the S.A.V.M.A. member on the Veterinary Board, and went on to anncunce the new office bearers for the ensuing year, as follows :—

President : Mr. F. J. Carless.
Vice-President : Dr. H. H. Curson.
Council Members : Messrs. P. J. du Toit, P. J. J. Fourie, A. C. Kirkpatrick, A. D. Thomas, J. L. Dickson, A. M. Diesel, D. G. Steyn, C. J. van Heerden.
Hon. Sec.-Treasurer : Mr. R. du Toit.

5. **Reports of Committee.**

(a) *Finance Committee's Report.* The Secretary read the financial statement for the year ending 31/3/35, which showed a surplus of £64. He drew attention to the fact that this surplus was made up almost entirely of four life subscriptions of £15.15/- each which had been paid recently. Mr. Carless moved that the Balance Sheet be adopted. Dr. Curson seconded, and this was agreed to.

Dr. Curson proposed that in view of the sterling work done by Dr. Fourie for the association during his period of office in the last two years, an honorarium be given to him as a token of appreciation. The President supported this motion and it was agreed to. The Secretary then read the estimates for the year ending 31/3/36, showing an estimated surplus of £118, provided all subscriptions and arrears were paid.

(b) *Status Committee's Report.* Dr. Quin, convenor of the Status Committee, read the report in which certain recommendations were made for part-time appointments for Government Veterinarians, including municipal and private work.

The Secretary said that he had been in correspondence with the Secretary for Agriculture and Forestry in this connection, and that while no favourable reply had yet been received, the matter was still under consideration.

(c) *Editorial Committee's Report.* The Secretary proposed that the report of the Editorial Committee, which had already been circulated, be adopted. Seconded by Dr. Alexander and carried.

(d) *Librarian's Report.* Dr. Curson moved that the Librarian's report, which had already been circulated, be adopted. Seconded by Dr. P. J. du Toit and carried.

Dr. Curson said that the Librarian had requested him to point out to the meeting the desirability of having a standing library committee. He moved that a library committee be added to the list of standing committees. Seconded by Dr. P. J. du Toit, and carried.

(e) *Parliamentary Committee's Report.* Dr. P. J. du Toit, convenor, stated that there had been no report prepared, but that the Veterinary Board was now considering several amendments, which it was considered advisable to include in the Act, although this year it had been impossible to bring these up in Parliament, and it was hoped that next year there would be some progress made. If any members of the Association had thought of amendments that should be introduced, he would be glad if they would bring them to the notice of the Committee.

In reply to a question raised by Dr. Curson in connection with a seat for a veterinarian on the Public Health Council, the speaker said that the matter was not yet quite settled, but that an amendment to the Public Health Act was shortly to be introduced to the effect that the Director of Veterinary Services should have a permanent position on the Public Health Council.

6. **Resignations.** The Secretary intimated that formal resignations had been received from Messrs. G. May and A. G. Grist and said that he had no option but to move that they be accepted. Seconded by Dr. P. J. du Toit and carried.

7. **Notices of Motion.**

(1) Notice of motion to ask a member to resign. The Secretary stated that he now wished to withdraw his motion as a letter of resignation had been received from Mr. Clayton. He therefore proposed that the resignation of Mr. Clayton be accepted. Seconded by Dr. Curson and carried.

(2) Notice of motion that the term "Hon. Sec.-Treasurer" be altered to "Hon. Sec. and Treasurer." By P. J. J. Fourie to alter constitution rule 9 (B) — substitute for Secretary-Treasurer, Secretary, Treasurer and alter the rest of the constitution accordingly.

Dr. Curson said that after much consideration of this matter he wished to ask the meeting not to proceed with the motion, especially as the matter had not been carefully considered by a Council Meeting. He therefore moved that it be referred back to Council, and this was agreed to.

(3) Notice of motion by the Finance Committee re Life Subscription. "By Finance Committee (Mr. Jackson, Drs. Curson, Quinlan and Fourie) alter rule 3 (b) by substituting 30 for 15 and adding with retrospective effect from 1.4.34."

The Secretary said that when the annual subscription was raised from £1.1/- to £2.2/- from 1.4.34, the question of the life subscription had been entirely overlooked, whereas in his opinion it should have been raised accordingly. He had included a clause at the end of the resolution raising the subscription, worded as follows: ". . . and that the Constitution be altered accordingly," and he submitted that this clause automatically raised the amount of the life subscription payable. Unfortunately, four members had in the meantime paid the sum of £15 .15/-, which had been accepted by the Assistant Secretary as a life subscription in each case. It was for this reason that the clause "with retrospective effect from 1.4.34" was included in the above resolution.

Dr. Curson objected to the last clause of the resolution, i.e. "with retrospective effect," etc., and proposed that it be deleted from the resolution.

Mr. Brown pointed out that the last clause of the resolution was *ultra vires,* and seconded Dr. Curson's motion.

Dr. P. J. du Toit proposed an amendment in place of this clause, viz.: "and that the Life Subscription be raised to 25 guineas."

Dr. Curson's motion was then voted upon, and carried by 16 votes to 7, and then the amended motion was carried unanimously.

8. **General.**

(1) *Notice of motion by Mr. Nicol.* The following notice of motion by Mr. Nicol was read to the meeting:—

> "All existing office bearers shall be eligible for re-nomination at the termination of their period of office except the president who shall not be eligible for that office again until the following year but can accept any other office."

(2) *Next Autumn General Meeting.* Mr. Snyman suggested that the next Autumn General Meeting at the Show be held on the Saturday after Good Friday in preference to the Thursday before Good Friday. This would be much more convenient for district veterinarians visiting the show. It was agreed to refer this matter to the incoming Council.

(3) *Mr. Clayton — assistance for.* Mr. Kirkpatrick said that he thought that something should be done by the Association to help Mr. Clayton and suggested that some monetary assistance would be of value to him.

It was agreed that the matter be referred to Council with power to act.

(4) *Expert Witness Fees.* Mr. Runciman drew attention to the fact that expert witness fees in Johannesburg were still standing at 15/9 per day, having been reduced to this sum some years ago from the £1.1/- paid previously. Medical expert witnesses received £2.2/- per day.

This matter was referred to the new Council.

(5) *Thanks.* Dr. P. J. du Toit proposed a hearty vote of thanks to the President and this was carried unanimously.

The meeting then terminated at 3.30 p.m.

Minutes of Council Meeting held at the Show Grounds, Johannesburg, on 18th April, 1935, at 3.35 p.m.

Attendance: Mr. F. J. Carless (in the Chair), Messrs. P. J. du Toit, P. J. Fourie, H. H. Curson, A. C. Kirkpatrick, R. du Toit (Hon. Sec.-Treasurer) and M. H. V. Brown.

1. **Standing Committees.** The following Standing Committees were appointed :—

Finance Committee: Dr. H. H. Curson, Dr. J. B. Quinlan, Messrs. C. Jackson and M. H. V. Brown.

Status Committee: Dr. J. L. Quin, Mr. A. McNae and Dr. D. G. Steyn.

Editorial Committee: Dr. P. J. du Toit, Dr. A. D. Thomas, Dr. E. M. Robinson, Messrs. C. Jackson and M. H. V. Brown.

Library Committee: Dr. P. J. du Toit, Dr. P. J. Fourie, Dr. A. D. Thomas, Mr. C. Jackson and Dr. H. H. Curson.

Parliamentary Committee: Mr. J. J. G. Keppel, Dr. P. J. Fourie, Dr. P. J. du Toit, and Mr. C. J. van Heerden.

2. **Mr. Clayton — Assistance to.** It was agreed that the sum of £10.10/- be given to Mr. Clayton immediately on his release.

3. **Complaint — Mr. McCall.** Mr. Carless read a letter from Mr. D. B. McCall in which the latter deprecated the Jockey Club's recent action in warning Mr. Bogue, a veterinary surgeon, off the Turf and appointing a layman as official measurer at the Clairwood Racecourse.

It was agreed that this matter be left to the Veterinary Board.

The meeting then terminated at 4.30 p.m.

FINANCIAL STATEMENT FOR PERIOD 1/4/34—31/3/35.

1/3/34.								
To Balance				£12	7	4	By Union Loan Certificates	£1,041 12 0
,, Standard Building Society Withdrawal	£738	2	6				,, Printing and Binding	263 16 2
,, St. Andrew's do.	304	0	8				,, Dinner & Entertainment	33 0 3
,, Subscriptions	348	12	0				,, Benevolent Fund	30 0 0
,, Advertisements	45	8	0				,, Administrative Expenses	19 10 0
,, Dinner	27	1	4				,, Typing and Roneo Work	18 2 6
,, Journal Subscriptions	32	11	5				,, F. J. Carless Expenses Council meeting	9 16 6
,, Reprints	4	0	6				,, Photos and frames	8 5 3
,, Cheque Book	0	12	8				,, Clerical Assistance	6 0 0
,, Bank amount L/O	0	9	0				,, Bank Charges	5 11 0
				1,500	18	1	,, Cheque post dated and redeposited thrice	4 4 0
							,, Railage on books donated	3 0 4
							,, Greatrex, Ltd., Folio Case	2 18 6
							,, Badge, R. Hartig	2 2 0
							,, Auditing	1 1 0
								£1,448 19 6
							,, Balance B/D	64 5 11
				£1,513	5	5		£1,513 5 5

1/4/35.			
To Balance B/F	£64	5	11
,, ,, ,, Petty Cash	0	11	9

Reserve Fund at present Total £1,168 18 6

Audited and found correct.

(Sgd.) C. O. WADNER.

J. SPREULL.

J. Spreull, eldest son of the late Andrew Spreull, F.R.C.V.S., was born 12/3/74 at Dundee, Scotland, and educated at the High School of that city. He qualified at the New Veterinary College, Edinburgh on

J. SPREULL.

24/5/95 and won the 3rd Fitzwygram Prize open for competition to the graduates of that year, and spent the winter of 1895-6 attending the lectures and clinique at the Ecole Vétérinaire d'Alfort, France. In 1896 he accepted a six months engagement offered by the late Dr. Hutcheon, C.V.S. Cape Colony, to help in the campaign against rinderpest. After

a few days spent at Dr. Koch's rinderpest compound, he proceeded to Barkly West to carry out the policy of destroying infected herds. Shortly afterwards he was transferred to Aliwal North and then to Herschel district, where the bile inoculation treatment was being extensively employed. It was here at Fonteintje that he employed for the first time in the field the defibrinated immune blood method advocated by Professor Bordet. A decided success was obtained in this instance although the method was later found to be unsuited to other districts owing to the presence of piroplasms in the blood of so many cattle immune to both rinderpest and redwater. After a short period of service at Malmesbury and at the Eerste River Junction anti-rinderpest serum camp he was transferred to Kluklu. Fort Beaufort, in May, 1898, where he assisted R. W. Dixon to work out the life history of the common blue tick, the first work of this kind done in South Africa. During 1899—1900 he was stationed at Cape Town, to inspect at the port all equines arriving by transport for the Anglo-Boer War. During the years that followed he was occupied in various parts of the Cape with foot and mouth disease, lung sickness, heartwater, bluetongue and again with rinderpest when it was finally stamped out.

Whilst on leave in 1908 he obtained his F.R.C.V.S. and came back to the Transvaal where he had extensive experience with the then spreading East Coast Fever.

In 1912 he became S.V.O. Transkei and in 1916 was transferred to Pretoria as S.V.O. Transvaal. He came to Cape Town in 1921 as S.V.O. Cape, which post he filled until his retirement in March, 1934. As one of the pioneers of Veterinary Science in this country he can justly be proud of his record of service, and deserves well of this country for the part he has played in the successful eradication of diseases such as glanders, lung sickness, foot and mouth disease, and rinderpest, some of the worst pests this country has known.

We wish Mr. Spreull success in his further activities and happiness in his well earned retirement from the service.

THE WORLD POULTRY CONGRESS IN BERLIN, 1936.

The Sixth World Poultry Congress which combines an Exhibition of live animals, industrial articles, and an instructive Federal State Exposition, takes place from the 31st of July till the 9th of August, 1936, in Berlin.

The Exhibition is at the same time as the Olympian Games, which also take place in Berlin.

As both happen simultaneously, many visitors are expected in Berlin on account of the cheap fares from all parts of the world. There will be a large exhibition of live animals, foreign as well as German ones. With regard to the details of the Congress and the Exhibition, we are able to give the following information.

The Exhibition will take place in the large premises of the Fair and Exhibition. The halls are as spacious as the well-known Crystal Palace in London and are equally well lighted, so that all articles exhibited, especially the animals, are shown to the best advantage.

At the request of the World's Poultry Science Association, which organizes this Congress every three years, it has been agreed upon that the number of animals will be limited.

This applies to each country as at this Exhibition only two of the best animals of each race and colour will be allowed to be exhibited. However, one will not keep strictly to this rule; a larger number can be shown if there are in the different races valuable animals, productive ones with a good pedigree.

The standard price for 1—2 hens or ducks is fixed at RM. 8.—, for 1 goose or turkey RM. 12.—, for one pigeon RM. 5.—, and for one rabbit RM. 5.—.

More details of the Exhibition, as also of the industrial articles, may be had from the General Secretary of the World Annual Congress, Berlin SW. 68, Kochstr. 6/7.

The Animal and Industrial Exhibition will be supplemented by an instructive Exposition of the Federal States, in which each State brings forward what it has reached in poultry breeding, etc., in recent years. Each State informs the world of its success in poultry breeding and gives details of its research.

These instructive expositions are of the greatest interest for poultry breeders of the world, as the exchange of international research is thus furthered.

This will be all the more demonstrated by the lectures arranged by the Congress. Lectures will be given on the best and most important points which have been achieved in poultry science within the last years.

Attendance at these lectures will recompense all experienced breeders. These lectures will take place in the Prussian House, the former House of Parliament, which is considered by many the most beautiful building in Berlin. Large halls are available for the chief lectures as well for the different sections.

All comforts that a Congress visitor desires, own Restaurant, Post Office, reading and writing room, will be at the disposal of the Congress members.

Although the building is in the centre of Berlin, no noise can penetrate the rooms from the streets, nor will the meetings be disturbed by the crowing of cocks, etc.

The Congress contribution is RM. 16.— if booked up to the 30th June, 1936; and RM. 20.— if booked later.

The German Congress Direction requests the booking of the members of the Congress at an early date so that they can provide the necessary accommodation; also to know how many members will take part in the receptions and sight seeing trips. Only if booked early will it be possible to give to the members of the Congress the accommodation and advantages which the German Congress Direction is anxious to provide.

A special price has been fixed for the ladies of the members of the Congress : RM. 8.— till the 30th June, 1936; RM. 10.— if booked later.

A reduced fee of RM. 5.— has been fixed for such persons who wish only to attend the principal lectures of the Congress, but are not admitted to the receptions and sightseeing excursions.

At the Congress termination there will be a wonderful 8-day trip round Germany, during which the visitors will have the opportunity to visit the leading German poultry farms and breeding centres, as well as the most beautiful spots in Germany.

INDEX TO THE GOVERNMENT VETERINARY REPORTS (TRANSVAAL AND UNION OF SOUTH AFRICA) — 1903—1932.

COMPILED BY CECIL JACKSON, HON. LIBRARIAN, S.A.V.M.A.

The abandonment of the title "Report" for the research publications of the Division of Veterinary Services and the institution (in 1933), after the issue of the last (18th) "Report", of a quarterly "Journal" offers a convenient opportunity for indexing the wealth of literature contained in the "Reports". Indeed, this task is already considerably overdue. Those of us who have not acute memories for numbers will know how much time is wasted in searching for our requirements among the 21 publications which are indexed here and which contain some 426 articles written by about 93 authors.

Originally the author index existed as a rough draft compiled by Mr. N. C. Horwell for my own use. I am grateful to him for this assistance.

As the work has had to be done hurriedly, it is not anticipated that the indices will be free from errors. In the subject index cross-indexing has been undertaken in exhaustive detail to save the time of those who may consult it. In the author index, names of junior authors are cross-indexed with those of the senior authors, under which the reference will be found.

1. Author Index.

The information is given as follows: Surname followed by initials, year (in brackets), subject (in brief), report, page. Reports of the Government Veterinary Bacteriologist (Transvaal, 1903—10) are indicated by G.V.B. Reports of the Director of Veterinary Research (U. of S.A., 1911—28) and the Director of Veterinary Services (U. of S.A., 1929—32) are quoted by number, followed (where necessary) by part number in brackets. Page numbers always follow a colon.

Alexander, R. A. (1928) *Lasiosyphon anthylloides*, 13/14 (1) : 231; (1929) Bleeding, 15 (1) : 227; (1930) see du Toit and Alexander; (1931) Heartwater, 17 (1) : 89; see du Toit and Alexander.

Andrewes, W. H. (1912) Trypanosomiasis, 2 : 362; Snakes, 2 : 406; (1923) Staggers, 9/10 : 121; *Adenia digitata*, ib. : 379.

Baer, J. G. (1926) Helminth fauna, 11/12 (1) : 61.

Bedford, G. A. H. (1912) Ticks, 2 : 343; (1915) *Psoroptes communis*, 3/4 : 101; Dipping trials, *ib.* : 163; (1918) Gastrophilus, 5/6 : 625; Anoplura, *ib.* : 709; Culicine larvae, *ib.* : 737; (1926) Nagana, 11/12 (1) : 275; Mucidae and Oestridae. *ib.* (1) : 483; External parasites, *ib.* (1) : 704; (1928) Trichodectidae, 13/14 (2) : 841; Dipping fluids, *Psoroptes communis*, *ib.* : 861; Mosquitoes, *ib.* : 883; (1929) Ticks, 15 (1) : 493; Anoplura, *ib.* : 501; Dipping, *ib.* : 551; (1930) Mallophaga, 16 : 153; (1931) Mallophaga, 17 (1) : 283; (1932) Goat Mange, 18 (1) : 145; *Argas striatus*, *ib.* : 221; Ectoparasites, *ib.* : 223; see du Toit and Bedford.

Bekker, J. G. (1929) Anthrax, 15 (1) : 183; (1930) Anthrax vaccine, 16 : 147; (with S. D. Rossouw) Conditions in sheep in Strandveld, 16 : 293; (1931) see Malan and Bekker; (1932) Phosphorus and Iodine supplements, 18 (2) : 733; Administration of phosphorus, *ib.* : 751.

Reprints of this valuable index will be drawn for the convenience of those who possess sets of D.V.S. Reports, and wish to keep it handy. Copies may be ordered from the Editor S.A.V.M.A. at 2/6 post free.

II. Subject Index.

A.

* Numbers in this series which are missing here are to be found in other journals.

B.

C.

D.

E.

F.

G.

H.

I.

J.

K.

L.

M.

* Numbers I to IX of this series were published elsewhere.

N.

O.

P.

Q.

R.

T.

U.

V.

W.

Jl. S.A.V.M.A.
VI. (3) 1935.

A Further Experiment to Determine the Safe Dose of Sulphur for Sheep.

By DOUW G. STEYN, B.Sc., Dr. Med. Vet., D.V.Sc.

In previous experiments (Steyn, 1931, 1932, and 1934) full grown Merino sheep received five grams of sulphur daily (except Sundays) and bovines up to forty-five grams of sulphur daily over prolonged periods without suffering any ill-effects.

It was decided to ascertain the effects of prolonged administration of daily doses of five grams of sulphur to immature sheep. Eighteen two-teeth Merino wethers born and bred at Grootfontein College, Middelburg, Cape Province, were used in this experiment. Mr. G. Mare, sheep and wool officer at the above college kindly selected the sheep in order to obtain animals of approximately the same age, type, and weight. Wethers were employed in the experiment in order to ascertain whether sulphur played a rôle in the production of urinary calculi, as in previous experiments (Steyn 1931 and 1932) there appeared to be indications of this effect.

The administration of sulphur was commenced about a month after the sheep had arrived at Onderstepoort. Throughout the experiment all the animals were running in a gravelled pen about 225 square yards in size. Their diet consisted of crushed mealies and teff hay, and green feed (barley, lucerne, etc.) *ad lib.* A point was made of always keeping an excess of all the feeds in the mangers.

The sheep were divided into two groups of nine each,* one group receiving sulphur and the other acting as control. It was essential to include a control group in order to compare the rate of growth of the two groups as the continuous administration of slightly toxic doses of sulphur will retard the growth of young animals. Sulphur was administered to one group at the rate of five grams daily for a period of sixteen months and the animals in both groups weighed at bi-weekly intervals.

In order to avoid the possibility of the sulphur being inhaled, it was moistened before administration. No arsenic was present in the sulphur used.

*About two months after commencement of the experiment one sheep in the sulphur group developed nervous symptoms. The animal was killed and a large number of *Oestrus ovis* larvae was found in the frontal sinuses. There was also evidence of irritation of the meninges.

TABLE I.

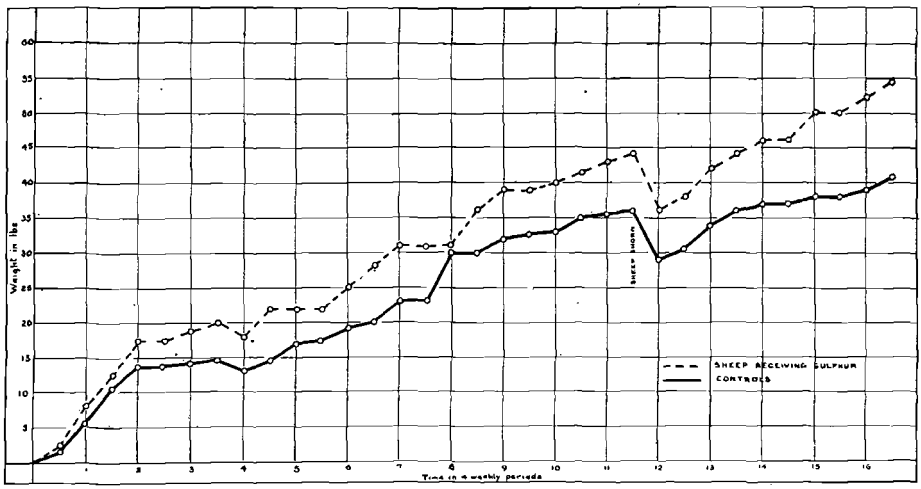
Each Sheep received 5.0 gm. of sulphur daily, except Sundays (i.e. 30 gm. per week), for the period 9/3/34 to 30/6/35.

No :	38967		38976		38970		38973		38974		38975		38978		38983	
Age :	2-Tooth		2-Tooth		2-Tooth		2-Tooth		2-Tooth		2-Tooth		2-Tooth		2-Tooth	
Sex :	Wether		Wether		Wether		Wether		Wether		Wether		Wether		Wether	
Date of Weighing	Weight in lbs.	Increase	Weight in lbs.	Increase	Weight in lbs.	Increase	Weight in lbs.	Increase	Weight in lbs.	Increase	Weight in lbs.	Increase	Weight in lbs.	Increase	Weight in lbs.	Increase
9/ 3/34	55		55		56		53		47		51		55		55	
23/ 3/34	58	3	60	5	56	—	53	—	48	1	53	2	59	4	60	5
6/ 4/34	65	10	64	9	63	7	60	7	59	12	58	7	68	13	63	8
20/ 4/34	68	13	70	15	66	10	63	10	61	14	64	13	69	14	67	12
4/ 5/34	73	18	75	20	70	14	71	18	68	21	67	16	73	18	72	17
18/ 5/34	72	17	77	22	71	15	68	15	64	17	67	16	74	19	72	17
1/ 6/34	73	18	76	21	72	16	70	17	66	19	70	19	76	21	74	19
15/ 6/34	77	22	77	22	72	16	72	19	66	19	70	19	77	22	74	19
29 /6/34	70	15	78	23	70	14	70	17	66	19	70	19	79	24	70	15
13 /7/34	75	20	81	26	72	16	74	21	70	23	72	71	83	28	76	21
27 /7/34	78	23	81	26	77	21	74	21	73	26	76	25	78	23	80	25
10/ 8/34	79½	24½	79	24	75	20	70½	17½	71½	24½	75	24	72	17	80½	25½
24/ 8/34	86	31	79	24	78½	23½	72½	19½	76	29	77	26	75½	20½	84	29
7/ 9/34	91	36	83	28	81	25	74	21	80½	33½	80	29	77½	22½	87½	32½
21/ 9/34	92	37	84	29	85	29	77	24	82	35	80	29	85	30	89	34
5/10/34	94	39	84	29	85	29	77	24	82	35	80	29	87	32	90	35
19/19/34	96	41	90	35	87	31	79	26	86	39	84	33	90	35	92	37
2/11/34	96½	41½	91½	36½	90½	34½	85	32	90	43	84	33	93	38	93	38
30/11/34	100	45	94½	39½	87	31	90	37	92	45	85½	34½	94½	39½	95	40
15/12/34	101	46	96	41	89	33	87	34	94	47	85½	34½	95	40	94	39
28/12/34	104	49	96	41	90	34	88	35	94	47	85	34	96	41	95	40
9/ 1/35	105	50	98½	43½	91	35	92	39	96	49	85	34	97	42	97½	42½
25/ 1/35	107	52	99	44	94	38	93½	40½	97	50	85	34	99½	44½	98	43
8/ 2/35	108	53	100	45	95½	39½	95½	42½	97½	50½	85	34	100½	45½	98	43
22/ 2/35	108	53	90½	35½	90½	34½	87	34	89	42	79	28	89	34	86	31
8/ 3/35	102	47	91½	36½	92	36	90	37	90½	43½	90½	39½	91	36	87	32
22/ 3/35	105	50	95	40	95	39	94	41	96	49	94	43	95	40	90	35
5/ 4/35	111	56	97½	42½	97	41	94½	41½	90	43	95½	44½	96½	41½	93	38
20 /4/35	112	57	99	44	100	44	97	44	97	50	97	46	98	43	97	42
3/ 5/35	113	58	87	32	101½	45½	98	45	100	53	89	36	98	43	98½	43½
17/ 5/35	114	59	Died	—	102	46	100	47	103	56	90	39	101	46	99	44
1/ 6/35	114	59			102	46	100	47	104	57	88	37	101	46	100	45
15/ 6/35	116½	61½			105	49	102	49	104	57	92	41	103	48	103	48
30/ 6/35	118	63			108	52	102	49	106	59	90	39	107	52	107	52
Weight of 1-year old clip.	11é5lb.		11lb.		9.5lb.		9lb.		10.3lb.		8.8lb.		11lb.		10.6lb.	
Average weight of clip							10.2lb.									

TABLE II.

Control Sheep.

No.:	38965	38966	38971	38972	38977	38979	38980	38981	38982
Age:	-Tooth	2-Tooth	2-Tooth	2-Tooth	2-Tooth	2-Tooth	2-Tooth	2-Tooth	2-Tooth
Sex:	Wether	Wether	Wether	Wether	Wether	Wether	Wether	Wether	Wether
Date of Weighing	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase	Weight in lbs. / Increase
9/ 3/34	54	51	54	56	55	54	56	52	53
23/ 3/34	50 −4	54 3	52 −2	61 5	58 3	57 3	57 1	53 1	55 2
6/ 4/34	56 2	57 6	57 3	62 6	58 3	61 7	63 7	61 9	60 7
20/ 4/34	63 9	62 11	64 10	66 10	64 9	66 12	67 11	64 12	63 10
4/ 5/34	64 10	62 11	66 12	74 18	66 11	68 14	71 15	68 16	68 15
18/ 5/34	65 11	62 11	66 12	75 19	64 9	69 15	66 10	68 16	66 13
1/ 6/34	66 12	59 8	66 12	73 17	66 11	68 14	69 13	70 18	66 12
15/ 6/34	64 10	62 11	66 12	76 20	67 12	66 12	73 17	70 18	72 19
29/ 6/34	63 9	54 3	63 9	76 20	67 12	66 12	73 17	69 17	71 18
13/ 7/34	67 13	57 6	67 13	76 20	66 11	68 14	76 20	71 19	70 17
27/ 7/34	71 17	64 3	66 12	77 21	68 13	68 14	78 22	71 19	74 21
18/ 8/34	71½ 17½	65 14	68 14	76 20	69½ 14½	69 15	79½ 23½	72 20	74 21
24/ 8/34	71 17	66½ 15½	67 13	77½ 21½	71½ 14½	70½ 16½	80½ 24½	75½ 23½	75½ 22½
7/ 9/34	70½ 16½	69 18	69½ 15½	78½ 22½	73 18	73½ 19½	79 23	77 25	76½ 23½
21/ 9/34	70 16	70 19	72½ 18½	84 28	74 19	76 22	85 29	79 27	79 26
5/10/34	71 17	70 19	75 21	81 85	76 21	78 24	90 34	80 28	82 29
19/10/34	74½ 20½	78 27	79 25	89 33	79½ 24½	82 28	94 38	82½ 30½	86½ 33½
2/11/34	75½ 21½	79 28	81½ 27½	91 35	82 27	82 28	95 39	84 32	88 35
30/11/34	80 26	85 34	84 30	90 34	83 28	87 33	96 40	87 35	91 38
15/12/34	79½ 25½	80 29	86 32	94 38	83 28	87 33	94½ 38½	85 33	90 37
28/12/34	76 22	80½ 29½	88½ 34½	94½ 38½	83 28	88 34	93 37	86½ 34½	91½ 38½
9/ 1/35	80 26	84 33	88½ 34½	93 37	86 31	92 38	92½ 36½	90 38	94 41
25/ 1/35	81½ 27½	86½ 35½	87 33	92 36	87½ 32½	93 39	93 37	91½ 39½	95 42
8/ 2/35	81½ 27½	86½ 35½	87 33	93 97	90 35	97 43	93 37	92 40	90 37
22/ 2/35	76½ 22½	79 28	88 34	85½ 29½	80 25	86 32	87 31	85 33	80 27
8/ 3/35	78½ 24½	85 34	79 25	89 33	83 28	87 33	89 33	87½ 35½	82 29
22/ 3/35	83½ 29½	86½ 35½	83 29	89½ 32½	86 31	90 36	93 37	90½ 38½	88½ 35½
5/ 4/35	84 30	89½ 38½	86½ 32½	93 37	87 32	91 37	97 41	92 40	90 36
20/ 4/35	82 28	92 41	91 37	95 39	88 33	94 04	91 35	94 42	92 39
3/ 5/35	81½ 27½	92½ 41½	91 37	96 40	90½ 35½	95 41	90 34	94 42	92 39
17/ 5/35	84 30	92 41	91 37	96 40	90 35	95 41	77 21	92 40	92 39
1/ 6/35	84 30	93 42	92 38	96 40	88 33	95 41	78 22	94 42	92 39
15/ 6/35	86 32	95 44	94 40	98 42	88 33	100 46	77 21	96 44	94 41
30/ 6/35	88 34	96 45	97 43	98 42	90 35	101 47	76 20	96 44	93 40
Weight of 1-year old clip.	7.7lb.	7.8lb.	8.2lb.	12.2lb.	9lb.	8.2lb.	8.9lb.	8.5lb.	10.8lb.
Average weight of clip.					**9lb.**				



On 24/4/35, sheep 38967 developed symptoms of pronounced gastro-intestinal irritation, which resulted in death on 10/5/35, whilst sheep 38975 was affected in the same way, only to a much lesser degree. The fact that sheep 38980 in the control group developed the same train of symptoms on 11/5/35 excludes the possibility of sheep 38976 having suffered from sulphur poisoning.

From tables I and II it will be noticed that there was severe loss of weight in the three affected animals. At the conclusion of the experiment, sheep 38975 and 38980 appeared to be improving and subsequently recovered. It should be mentioned that sheep 38975 was receiving sulphur throughout the course of its illness, and definitely improved from 10/6/35. This fact also is against the above symptoms having been due to sulphur poisoning. The weights of the affected sheep were of course not considered in the graph from the time they began to lose in condition.

From the two tables given it is evident that the average weight of the sheep in the sulphur group before the administration of sulphur was commenced was 53.375lb., and that of the control group 53.9lb. At the conclusion of the experiment, that is, after the one group had received five grams of sulphur daily (except Sundays for a period of approximately sixteen months, the average weight of the sheep in the sulphur group was 108lb., whilst the average weight of the control group was 94.9lb. The weights of sheep 38975 (sulphur group) and sheep 38980 (control group) were not considered in this calculation for obvious reasons.

The average weight of the one-year-old wool clip of the sheep in the sulphur-group was 10.2lb., whilst that of the sheep in the control group was 9lb.

Dr. H. O. Mönnig, Head of the Department of Parasitology, Onderstepoort Laboratories, kindly examined the faeces of all the animals for internal parasites at intervals and is of the opinion that the degree of worm infection in the two groups of sheep was so slight that it could not possibly have an effect on the conditions of the animals.

At no time was there any evidence that the sheep receiving sulphur were suffering from urinary calculi.

Summary and Conclusions.

The average weight of the sheep in the sulphur group before the administration of sulphur was commenced was 53.375lb., and that of the control group 53.9lb. After the sheep in the former group had received five grams of sulphur daily for a period of approximately sixteen months, their average weight was 108lb., whilst that of the control group was 94.9lb.

The average weight of the one-year-old wool clip of the sheep, which had received sulphur was 10.2lb., whilst that of the clip of the control sheep was 9lb.

From the above data it is evident that five grams of sulphur administered to two-tooth Merino wethers for a period of sixteen months had no detrimental effect on the body-weight and wool yield of these animals.

References.

STEYN, D. G. (1931). The effects of sulphur on Merino sheep. *17th Rept. Dir. Vet. Serv. and Anim. Ind.*, August, 1931. pp. 481-482.

STEYN, D. G. (1932). The effects of sulphur on Merino sheep and their resistance to potassium cyanide poisoning. *18th Rept. Dir. Vet. Serv. and Anim. Ind.* August, 1932. pp. 597-610.

STEYN, D. G. (1934). The effect of sulphur on Merino sheep and a further experiment to determine the safe does of sulphur to cattle. *Jl. S.A.V.M.A.* V, (1), 18-22.

SOUTH AFRICAN VETERINARY BOARD.

The following changes have taken place in the personnel of the Board: Dr. P. J. du Toit, Director of Veterinary Services, has been appointed chairman, and Dr. H. Graf, of Onderstepoort, has been elected faculty representative.

Jl. S.A.V.M.A.
VI. (3) 1935.

Impaction of the Rumen in Cattle due to the Ingestion of the Cocoons of the Caterpillar *Gonometa rufobrunnea* Auriv.

By L. T. EDWARDS, B.V.Sc., Louis Trichardt.

Introduction.

During January, 1935, I investigated mortality in cattle which were dying in an area in the north-west of the Zoutpansberg district, Transvaal, after the ingestion of the cocoons of the caterpillar, *Gonometa rufobrunnea*. Up to the present time approximately 100 head of cattle have died in this area where the cocoons are prevalent. Upon investigation I found that death was due to impaction of the ruminal contents brought about by the breaking up of the cocoons, the strong threads

Fig. 1.
Contents of rumen and reticulum severely bound together by the threads of the cocoons. 1/10th Normal Size.

of which bind the contents of the rumen into a solid mass. This breaking up of the cocoons most likely commences during the process of rumination and is accomplished by the ruminal movements.

Occurrence.

The grey hairy caterpillar, *Gonometa rufobrunnea*, lives on the leaves of the *Mopani* trees and is found in the *Mopani* belt of the Zoutpansberg Bushveld. Within this belt the caterpillars occur in large numbers covering an area estimated at approximately 40 miles long and

10 miles broad with numerous smaller areas outside this area. These caterpillars spin their cocoons on the trees and, in badly affected areas, 150 to 200 cocoons are to be found on each tree. The older cocoons remain on the trees for about 1 to 3 years, but cattle do not eat them readily, preferring the younger cocoons because of their juicy nature. This is most probably due to drought conditions prevailing in this area at present, a surmise which is borne out also by the fact that one farmer within the area of the thickest infestation has not lost any cattle from this cause. He always has a plentiful supply of good water for his animals. It is also very probable that animals develop a liking for these cocoons, or ingest them accidentally.

Toxicity.

Experiments conducted at Onderstepoort with the dry pupae of the cocoons yielded the following results :—

One rabbit received 50 grams of the dry pupae (plus or minus 450 grams of live pupae) in 10 days ; and

One rabbit received 100 grams of the dry pupae (plus or minus 450 grams of pupae) in 10 days, without suffering any ill-effects.

As there is no reason to believe that the dried pupae of poisonous insects lose their toxicity during the process of desiccation, one can conclude that the pupae are not poisonous. It is also a well-known fact that certain fibrous grasses, or grasses with " hairy " ears, cause the formation of indigestible balls especially in young sheep and cattle, sometimes with fatal results. Such cases have occurred in young sheep in the Kenhardt and Grahamstown districts.

Symptoms.

The first symptom shown is that the animal appears " off colour." Its movements are sluggish and it also has difficulty in rumination. Cattle owners state that in some cases the animal is "off colour," gradually getting worse, for a considerable period, even as long as two months, before symptoms of acute impaction develop. The ruminal contents can be felt on palpation as a doughy mass. Large quantities of water are taken and after drinking the animal appears to be suffering from hoven. In the meanwhile the animal becomes weaker and weaker and eventually is unable to rise. A little food is taken if offered. Death occurs within a period of 4 to 7 days after the animal has gone down. No recoveries occur once the animal has developed symptoms.

Post-Mortem Appearances.

The chief post-mortem appearances are emaciation of the carcase and impaction of the forestomachs. Large numbers of whole cocoons

are present in the rumen and the strong threads of the cocoons bind the ruminal contents together. Examination of the ruminal contents reveals that their binding by the threads of the cocoons is a very slow process. It is probable that it is the result of the ingestion of a few cocoons daily over a long period. The accompanying photograph shews the impacted ruminal contents after the ingestion of cocoons. The animal died and the forestomachs, i.e., contents and stomach wall, were removed from the carcase and left exposed for some weeks. The stomach wall rotted off leaving a solid mass which was a rough cast of the rumen and reticulum. To indicate the solidity of this mass, I may state that I tied it to the bumper of my motor car and travelled 100 miles over rough roads without any damage being done to the specimen.

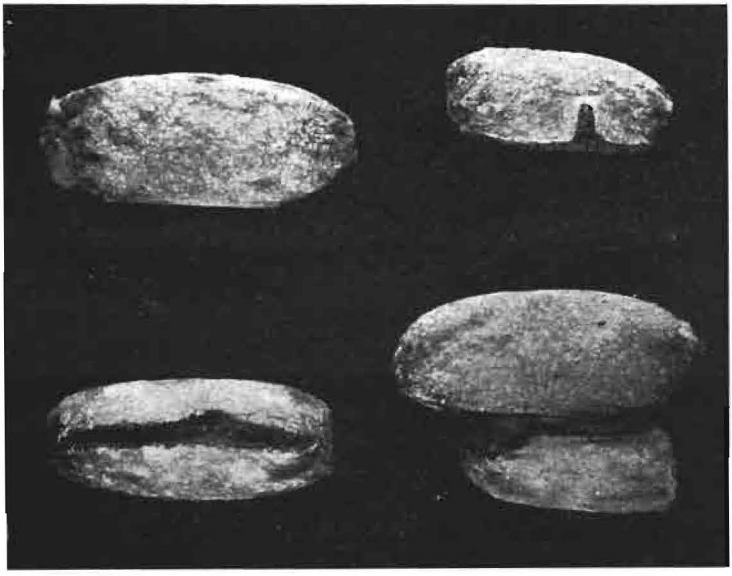


Fig. 2.
Cocoons of *Gonometa rufobrunnea* Auriv.
Natural Size.

Treatment.

It is obvious that no treatment except ruminotomy could be of any value.

Prophylaxis.

The cattle should be moved to veld where the cocoons do not occur. This was done with a number of herds owing to drought conditions and deaths ceased almost immediately. The eradication of cocoons could only be accomplished by picking them off and then destroying

them. This is impracticable owing to their large numbers and the expenses entailed, as the ground and grazing is of low value.

A plentiful supply of water and the use of licks undoubtedly lessen the incidence of the disease, but in the affected area water is very scarce owing to the drought.

Investigations by Dr. Naudé, Chief Entomologist, led him to believe that the balance of nature will soon be restored as there are many signs of parasitism and a number of larvae also appear to be dying of wilt disease.

Acknowledgements are due to Dr. Naude, Chief Entomologist, and Dr. Steyn.

Notes on Two Cases of Cysticercis.

By N. F. VILJOEN, M.R.C.V.S., Bloemfontein.

Cysticercus cellulosae in a Pig:—

On 21/5/35 a pig weighing 366lbs. was slaughtered. On his routine inspection, my qualified Meat Inspector found what he took to be a "measle" in the submaxillary gland. I confirmed his suspicion. No "measles" were found in any of the routine cuts. I thereupon asked my Inspector to make the secondary cuts laid down by the Public Health Regulations Act No. 36 of 1919. Several other "measles" were then found. The peculiar feature of this case is that this "measly" pig would have been passed as fit for human consumption if a "measle" had not been found in the very unusual site, viz., the submaxillary gland, since the secondary cuts are only made when "measles" are found in the standard routine incisions.

Cysticercus bovis in an Ox:—

The subject was slaughtered on 23/5/35. Routine inspection shewed more than 50 "measles" in the tongue, but no trace of a "measle" was found in any of other routine and secondary incisions.

Jl. S.A.V.M.A.
VI. (3) 1935.

A Case of Acanthoma of the Scalp of a Sheep.

By M. H. V. BROWN, B.V.Sc., Onderstepoort.

In April, 1935, a sheep with a large growth on the head, kindly sent in by Mr. Sloan, of Pilsden Farm, Port Elizabeth district, arrived at Onderstepoort for investigation. A photograph of the head was taken and the animal was examined clinically. The subject was a wether over six years old in fairly good condition and presenting no clinical abnormalities except the growth on the head. This was a large tumour on the left fronto-parietal region of the head. On its sides numerous deep fly larvae-infested ulcerating areas were present and the mass gave off a foetid odour.

After two X-Ray plates had been kindly taken by Dr. Quinlan of this Institute, the animal was destroyed by intravenous injection of 10 c.c. of saturated magnesium sulphate solution.

Fig. 3.
Front view of Sheep with Acanthoma of Scalp.

Macroscopical Examination.

The growth was situated on the dorsal surface of the left side of the head. In shape it resembled a cone with a broad base extending as far forward as, and bulging over the eye, and as far back as the occiput. On the left it overhung the eye and its right boundary was just across the median line of the skull. At its base it measured in an anterior

posterior direction 18 cms., from side to side 14 cms. From this broad, roughly circular base the mass tapered fairly regularly upwards until the base of the left horn was reached ; this was lifted a considerable distance from its normal position, as can be seen in the photograph (see fig. 3). The horn itself still preserved its normal appearance but the base had been pushed up to such an extent that the apex pointed downwards.

The base of the tumour up to about half of its total height was covered with skin and wool, but this gave place over the upper half to a horny cap, which was soft at first but became hard towards its tip, and which was continuous all round the growth with the horn itself. On the posterior surface of the growth several large ulcerating areas

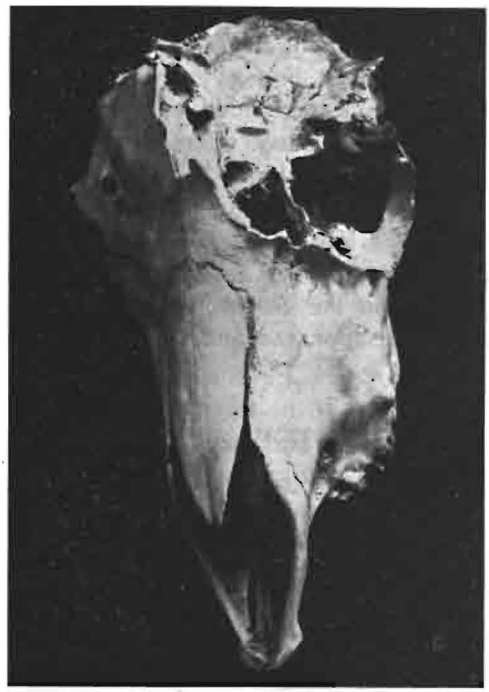


Fig. 4.
Left Dorsal view of Macerated Skull.

were present. Here the tissue presented a cauliflower-like appearance being greyish-white in colour and its surface being uneven and pitted. The upper left eyelid was pulled upwards and outwards greatly increasing the interpalpebral space. The left eye was unaffected except for a slightly increased intraocular pressure on palpation.

The X-ray photographs were taken laterally as a guide for the dissection of the tumour. They showed that numerous spicules of bone were present throughout the deeper parts of the tumour and that a

fairly dense bony plate extended vertically from the skull into the tumour. The whole mass was removed in one piece from the skull after fixation, care being taken not to break off the vertical plate of bone, and a deep roughly cup-shaped depression was left on the left dorsal surface of the skull. This cavity was lined by a thick capsule of fibrous tissue. A thin vertical plate of bone extended from the left frontal bone almost in the middle line into the medial portion of the growth. The tumour was composed of a dense greyish-white tissue with hard spicules of bone here and there. At the autopsy all organs were examined but no metastases could be found. The left parotid and prescapular lymph glands were enlarged and moist on section and were collected and fixed for microscopical examination.

The skull was macerated and examined. The cup-shaped depression was hollowed out of the side of the skull, involving the left frontal, parietal, malar and lachrymal bones, each of which had in part disappeared. A thin bony plate extended vertically from the left frontal bone 4 cms. high and 5 cms. long. The supraorbital process and the lateral part of the left frontal bone had disappeared almost entirely and the left posterior frontal sinus had been obliterated while the left anterior frontal sinus, the left maxillary sinus and the posterior nares were exposed. (See fig 4). Only a very thin paper-like plate of bone separated the tumour from the cranial cavity. The zygomatic process of the malar bone had disappeared and no trace was seen of the bony core of the left horn.

Microscopical Examination.

Sections of representative parts of the tumour were cut by the paraffin method and stained with Haematoxylin-eosin and van Gieson. Microscopically the tumour consisted of a dense stroma of ripe connective tissue in which numerous islets of epithelial cells were present.

These cells were large with prominent nuclei in which the nucleoli were larger than in normal epithelial cells ; double nucleoli were often seen and mitotic figures were frequent. Numerous horn-pearls were seen in which a circle of epithelial cells surrounded a number of concentric rings of hornified tissue. Spicules of bone were of frequent occurrence in sections from the deeper parts of the tumour while surface sections from the ulcerated areas showed a necrotic surface and an intense neutrophilic infiltration which more deeply became less marked.

A diagnosis of spino-cellular carcinoma or acanthoma was made on the microscopical picture and the naked eye appearance.

The sections cut from the left parotid and prescapular glands showed severe hyperaemia and infiltration with neutrophiles but no metastatic foci could be determined.

Conclusion.

This case was described on account of the interesting and unusual features it presented in that the growth had pushed the horn off its bony core and that the latter had disappeared ; it had caused extensive erosion as well as proliferation of the bones of the skull ; the bony cup was lined by a thick capsule of connective tissue probably derived from the hyperplastic periosteum ; and it is worth mention that from a carcinoma of such malignant type and of such large proportions no metastasis had occurred.

OBITUARY.

George William Freer.

Mr. G. W. Freer, late Senior Veterinary Officer, Cape East and Transkei, died suddenly at Port Elizabeth on March 21st, 1935, from heart failure. Having only retired from the Service on 27/4/'33, he did not long enjoy his pension.

The late Mr. Freer joined the Cape Service on 23/1/97 being engaged principally on the eradication of rinderpest when he first came to the Service. After this disease had been eradicated he was stationed at Port Elizabeth, where he inspected all the remounts that came through the Port during the Anglo-Boer War. He then had his headquarters at Uitenhage, where he was stationed for 14 years.

After acting as Senior Veterinary Officer in South-West Africa, Free State, and Natal, he was promoted Senior Veterinary Officer of the Transkei with headquarters at Umtata on 18/4/'16.

When he took over in the Transkei, East Coast Fever was widespread, but as a result of his energetic labours there were only six infected districts when he retired on pension in 1933.

In 1928 the Cape East was added to the Transkei, and his headquarters were changed to East London in January of that year, where he was Judge to the Nahoon Sporting Club and where he remained until he reached the age limit in April, 1933.

The late Mr. Freer was of a very genial disposition and was popular wherever he was stationed. He had never at any time been ill, and was in good health prior to his sudden and unexpected demise.

He leaves a widow and one son with whom the profession sympathises in their sad bereavement.

MATTERS OF VETERINARY INTEREST 1795-1881.
(Continued).

By H. H. CURSON, Onderstepoort.

CHAPTER IV.

Position in South Africa, 1840-1881.

(a) Introduction. (b) Veterinary Affairs in the (i) Cape Colony; (ii) Orange River Sovereignty; (iii) Natal, and (iv) Transvaal. (c) Conclusion.

(a) Introduction.

As a result primarily of the exodus of Dutch settlers from the Cape Colony in 1836, the field to be surveyed becomes greatly extended. Whereas previously it was only the territory south of the Orange River, consideration must now be given to three other territories, *viz.*: Orange River Sovereignty, Natal and Transvaal. Each will be discussed separately and reference will be made to the genesis of the state (civil) veterinary departments in the two last mentioned.

(b.i.) Veterinary Affairs in the Cape Colony.

The position at the close of the last chapter was that W. J. Kingsley has been appointed to the "Imperial" C.M.R., apparently the first veterinarian to hold this post. Very little is known of him but an idea of his duties may be gained by giving an outline of the unit which he served.

The first C.M.R. (1827-1870) was maintained by the Imperial Government. After a distinguished record in the Sixth Kaffir War (1835), the regimental strength in 1837 was raised to 462 cavalry and 300 infantry. Two years later, however, it was reduced to six companies of eighty rank and file. The men "were so harassed with patrolling that some of the regiments of the line were furnished with horses to assist in the duty." (Theal, VI., p. 178). (49).

During the Seventh (1846-7) and Eighth (1851-3) Kaffir Wars the C.M.R. saw a great deal of active service. During the former campaign further augmentation was authorised, first by two companies of Hottentots and later by an addition of 400 men. During the latter campaign many of the Hottentot soldiers deserted and joined the army. After this experience, the proportion of Europeans was increased, and in 1856 the regiment was almost 1,000 strong, and was "the only regiment in the service which had a horse for every man." At that time there were still 200 Hottentots in the unit, but by 1870, the date of

(49) This appears to be the first mention of mounted infantry employed in South Africa.

disbandment, only ten were left (Hook 1907). After disbandment all horses were sold. Headquarters were first at Grahamstown and later at Kingwilliamstown.

According to Legionary Gustav Steinbart (*Deutsch-Afrikaner*, July 20th 1933), in one of his letters from the eastern Cape Colony to his sister in Germany, there were in Kaffraria during the Indian Mutiny (1857) a few hundred cavalrymen and some artillerymen entirely without horses (which had been sent to India). The guns of the artillery were drawn by mules and the cavalrymen did their work on foot. Schreuder (1915, p. 86) mentions that during the Indian Mutiny England got all her horses from South Africa and these are still spoken of by Cavalry officers as 'the finest lot of horses ever imported into India'." (Quoting J. A. Nunn's *Report on the Horse Supply of South Africa*, 1888).

As will be seen in Table III, besides Kingsley two other veterinary surgeons served in the C.M.R., Messrs. T. Paton and F. F. Marshall, who will be referred to later.

Theal (VI., p. 133) records that shortly after the Sixth Kaffir War a "disease broke out among the horned cattle" in the Galeka (*i.e.* north of the Kei River) and "many thousands died." What it was will ever remain a mystery.

The arrival of the 7th Dragoon Guards, 332 strong, in June 1843, was an event of veterinary importance, for it was the first cavalry unit to arrive from Great Britain since the departure of the 21st Light Dragoons in 1817. According to Theal (VI., p. 189) the regiment was "at once sent to the frontier," Fort Beaufort (50) being headquarters. Apparently at first the men were not mounted (51) and an idea is obtained from Schreuder (1915, p. 42) of the difficulty in procuring remounts. Lieut.Col. Bower, with Major le Marchant, "came across a farm where the farmer said he had no horses to sell. After they had offsaddled Bower asked to be shown over the stables and found 'ten uncanningly neat bay geldings.'

On pressing for a sale of these, the farmer replied: 'Oh, these are my span (waggon team), and are not for sale!' The horses were subsequently trotted out and five were noted as fit for troopers. A second span was brought up from the veld and four were picked and after some amount of coquettry, nine good horses were added to the roll of the 7th Dragoon Guards.... However, the work *i.e.*, of securing

(50) Fort Beaufort was established as a military post in 1822 and as a township in 1837.

(51) Apparently even the Regimental History of the 7th Dragoon Guards does not make it clear whether horses were brought to South Africa, for in answer to a query on this point, in the reply from Tidworth (dated 1/10/35) the Adjutant states "not known."

sufficient remounts) was done and within three and a half months from disembarkation the regiment was reported fit to take the field and that, too, with horses that excited the approbation of two successive commanding officers fresh from England. . . . The horses were obtained from £24 10s. 0d. to £26 10s. 0d. each." It is interesting to know that the weight of a dragoon was above 19 stone (266lbs.)

The regiment was fully occupied during the Seventh Kaffir War, among other engagements, being represented at the Charge at the Gwanga on June 8th, 1846. (Fig. 5). It returned to Great Britain in April, 1848. The veterinary surgeon from 1846 was B. C. R. Gardiner who was the finest Scottish graduate to come to South Africa ([52]).

Fig. 5.
BATTLE OF THE GWANGA, June 8th, 1846.
(By H. Martens).

The uniform of the 7th Dragoon Guards was as follows: red stable *jacket* with blue collar and cuffs with a yellow or gold line round the top of the cuffs, brass buttons; *overalls* blue with a yellow or gold stripe; *cap* red with a yellow or gold band with a yellow or gold pom-pom on the top; *pouch-belt* white; *blanket roll* red, and *coat roll* red. (Letter 62/32 of 5/12/'34 from Adjutant, 4th/7th D.G., Tidworth).

Notice the C.M.R. who are wearing white overalls and dark green tunics. See a lithograph by Lt.-Col. Sir Harry Darrell showing the same encounter (Cory's *Rise of South Africa*, Vol. IV., p .459). At the Conference at Block Drift on January 30th, 1846, between Col. Hare and Sandile (Frontispiece, Cory's *Rise of South Africa*, Vol. IV.) the men are wearing helmets.

([52]) A request to the Principal, Royal (Dick) Veterinary College for other particulars relating to the Scottish graduates (Table III) was unsuccessful. Prof. Charnock Bradley (letter Oct. 26th 1934), made extensive enquiries but no information was obtainable.

It is convenient to refer now to the creation of a force of Kaffir police during the Seventh Kaffir War, the strength ultimately reaching 450 men of which approximately one quarter were mounted. (Theal, VII., p. 40). At the commencement of the Eighth Kaffir War most of them deserted to the enemy "with their arms and their horses" (p. 93).

In 1847 the British Government again changed its opinion regarding extension along the unsettled east, and the Keiskama River became the eastern frontier, with British Kaffraria (between the Keiskama and Kei Rivers) as "a distinct dependency of the crown." (Theal, VII., p. 53). Accordingly when the 12th Lancers arrived on October 12th 1851, to take part in the Eighth Kaffir War, the port of disembarkation was East London. The regiment had come out on the war steamer *Styx* ([53]), and according to Col. Hornby, 12th Lancers (letter HIJ/1/1 of 4/10/34) fifty horses were picked up at Capetown, and the remainder at Kingwilliamstown, which was not reached until October 16th. Further, Tylden (1933) states in connection with the Basutoland campaign of 1852 that the men were mounted on Cape horses. Prior to the departure of the 12th Lancers in December 1853 for India, the horses were handed over to the C.M.R. James Thacker was the veterinary surgeon of the regiment and will ever be remembered as the first veterinarian in South Africa to contribute an article to veterinary literature. When stationed at Kingwilliamstown, in October ,1853, he described (Thacker, 1854) four cases of disease in horses. Two were certainly glanders, although Thacker himself was doubtful of this diagnosis because of "the absence of ulceration and corded lymphatic vessels not being discoverable in the vicinity of the parts tumefied." The third case was "Mad Staggers (Phrenitis)" and the fourth case "Enteritis, with Rupture of Colon." Thacker again visited the Cape in 1875 as a remount officer. His diploma was dated January 31st, 1844 (London). He entered the Army on July 14th, 1846, and died at Melbourne on June 25th, 1876.

At the end of the Eighth Kaffir War the Frontier Armed and Mounted Police was organised, this designation being applied to the formerly separate police detachments of Albany, Fort Beaufort and Victoria. The strength of the force was approximately 500 and with the exception of ammunition the men provided their own equipment, including horses and saddles. In 1870 headquarters were removed from Grahamstown to Kingwilliamstown and in 1878 the force was reorganised on military lines, being designated the Cape Mounted Riflemen. The veterinary arrangements of the C.M.R. have already been described

([53]) This is the first definite record of cavalry having voyaged to the Cape in a steamer. No information is available concerning the method of transport used for the 7th Dragoon Guards. During the Crimean War (1854-56), horses were sent to the front in sailing vessels! (Smith, p. 139).

(Curson, 1932), but as it was essentially a unit of the Cape Government no further reference is made to it here (Williams, B. 1909 and Theal, VII., pp. 105, 178.

During 1854-55 severe epizootics of horse-sickness were experienced and an idea of the position in the Cape Colony may be gained by a study of Bayley's *Notes on the Horse-sickness at the Cape of Good Hope,* 1854-5 (54). This was published in 1856 and it contains short reports from W. J. Kingsley and Dr. G. A. Hutton (who was also a qualified veterinary surgeon). Kingsley's report is shown in Fig. 9. In the year 1854 lung-sickness of cattle was introduced " by a bull from Holland that was landed at Mossel Bay . . . and it was computed that before March 1856 in the Cape Colony alone fully 100,000 head" (Theal, VII., p. 146) had died. The governor, Sir George Grey, instructed Hutton to write a report but this has not been traced.

Fig. 6.

CATHCART'S CAVALRY BRIGADE (12th LANCERS, R.A., and C.M.R.) CROSSING THE ORANGE RIVER, PROBABLY ON NOVEMBER 30th, 1852, AT BUFFELSVLEI DRIFT.

(Original sketch by Lt.-Col. Carey, C.M.R., and published by R. Ackerman, June 1st, 1854).

The army was marching from Burghersdorp to Ladybrand, Orange River Sovereignty *en route* to deal with Moshesh. (Information provided by Mr. W. M. Hopley, Snr., through Mr. J. G. Carter, Magistrate, Burghersdorp—letter of October 30th, 1934).

(54) Theal (VII., p. 146) estimates that " no fewer than 65,000 animals perished . . . . in the colony " during 1854-5 of horse-sickness.

During this unsettled period, the discontented Xosas saw fresh hope when told in 1856 by a native girl Nonquase and her uncle, Umhlakoza, that the dawn of peace and plenty was at hand. This, however, could only be secured by the destruction of every goat, sheep and ox, and all foodstuffs. In due course, on February 18th, 1857, to be precise, a hurricane would drive the Europeans into the sea and there would be stock and food in abundance thereafter. Extraordinary to relate thousands of natives complied with the order with the result that in British Kaffraria alone approximately 70,000 deaths occurred from starvation. This delusion did more to destroy the Xosas than all the previous Kaffir Wars ([55]).

During the 'sixties two veterinary officers, both of the C.M.R., are known to have been stationed in Cape Colony. The first, Thomas Paton, obtained the Diploma of the Highland and Agricultural Society in 1855, and, after serving in the Crimea (1855-6), was detailed for duty at the Cape. In the *Veterinarian* of 1863 (XXXVI, p. 489) appears a copy of a letter written by Paton to the editor of the *Fort Beaufort Advocate* on "The Horse-sickness of the Cape of Good Hope." On August 31st, 1866 he was promoted to the First Class. In 1867, when stationed at Kingwilliamstown, he addressed a letter to the Editor of the *Kaffrarian Watchman* on "Horse breeding at the Cape and remounts for India." (*Veterinarian* XL., p. 781). Later he published an observation on "The hereditary transmission of glanders." (*Vet. Jl.* VI., p. 430), the case in question being a week-old foal dropped from an imported mare, the property of the Kingwilliamstown Stock and Produce Company. On the disbandment of the "Imperial" C.M.R., in 1870, he transferred to the Army Service Corps. He won not only a medal of the Royal Humane Society, but a bar was added for the rescue of a man who was drowning in the Liffey. His death took place at sea in 1876 on his return home from India, where he had served with the 4th Hussars.

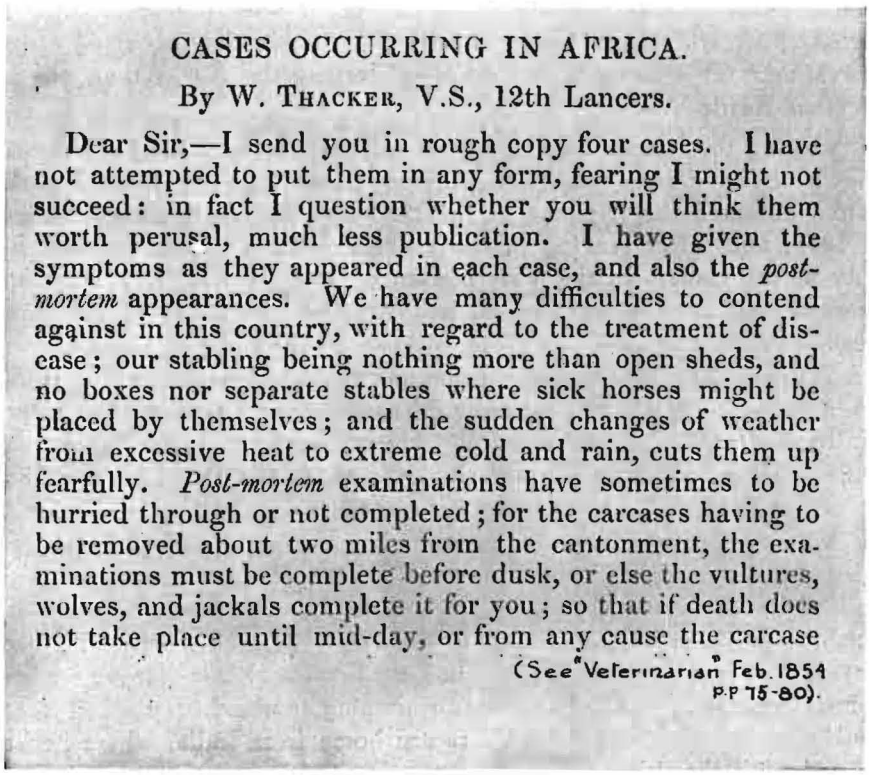
The second veterinary officer was Frederick Fitzhugh Marshall, who qualified at London in 1854 and joined the C.M.R. on June 22nd, 1860, serving in that regiment until June 7th, 1870, when he transferred to the 14th Hussars. He died at Blackheath on August 25th, 1905.

In 1872 the Cape Colony was granted self-government, and local responsibilities correspondingly increased; particularly during the years 1877-1881 when not only in the Colony, but in adjacent territories there was much unrest. These were the critical years of British rule in South Africa, especially from 1879-1881. Even before the Cape Government appointed veterinary surgeons to the newly organised C.M.R.

([55]) See Thesis, *An Investigation into the Circumstances relating to the Cattle Killing Delusion in Kaffraria*, 1856-57, by Miss E. d'A. Dowsley, Rhodes University College, 1931.

further Army veterinary surgeons were seconded for service in the Ninth Kaffir War (1877-78). These were First Class V.S. Francis Duck and V.S. B. L. Glover.

Since previous appointments to the Cape Colony had been with cavalry regiments, it is interesting to reproduce the *London Gazette* notice of May 7th, 1878, regarding the secondment of the above two



CASES OCCURRING IN AFRICA.

By W. THACKER, V.S., 12th Lancers.

Dear Sir,—I send you in rough copy four cases. I have not attempted to put them in any form, fearing I might not succeed: in fact I question whether you will think them worth perusal, much less publication. I have given the symptoms as they appeared in each case, and also the *post-mortem* appearances. We have many difficulties to contend against in this country, with regard to the treatment of disease; our stabling being nothing more than open sheds, and no boxes nor separate stables where sick horses might be placed by themselves; and the sudden changes of weather from excessive heat to extreme cold and rain, cuts them up fearfully. *Post-mortem* examinations have sometimes to be hurried through or not completed; for the carcases having to be removed about two miles from the cantonment, the examinations must be complete before dusk, or else the vultures, wolves, and jackals complete it for you; so that if death does not take place until mid-day, or from any cause the carcase

(See "Veterinarian" Feb. 1854 p.p 75-80).

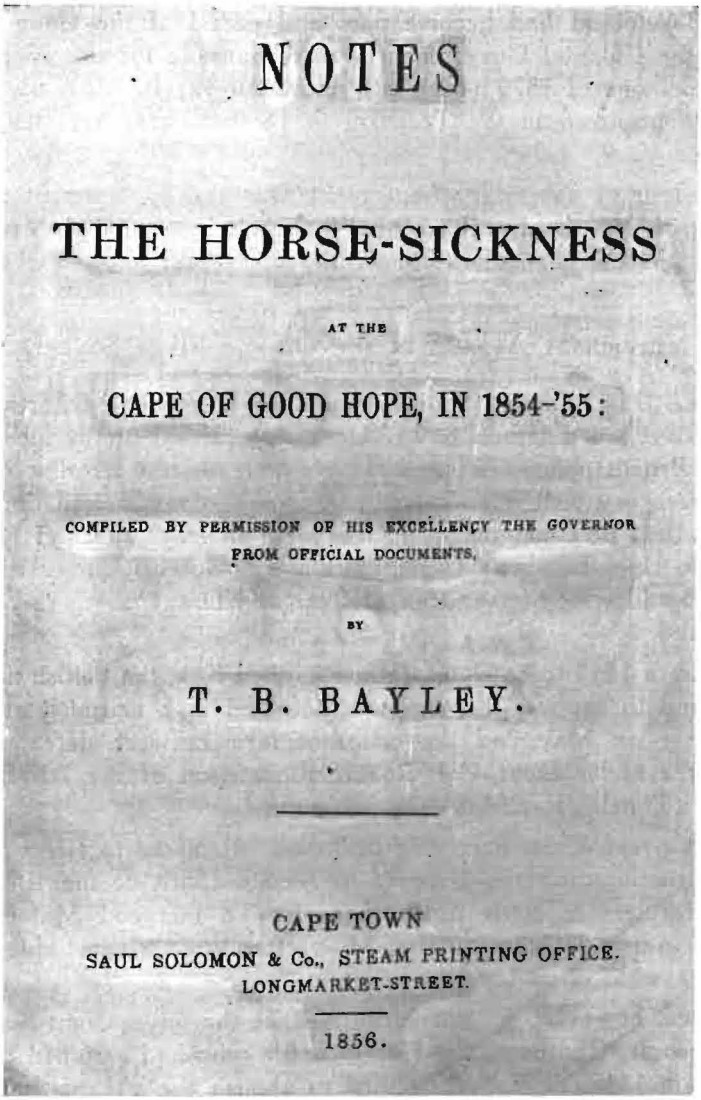
Fig. 7.

OPENING PASSAGE FROM THE FIRST PROFESSIONAL ARTICLE FROM SOUTH AFRICA.

Thacker wrote his notes at Kingwilliamstown and the date is October 2nd, 1853. Although the initial of the Christian name is given as W. (William), it would appear that James was the author. *The Veterinarian* p. 380, 1877, seems to have made a similar error when James died in 1876. James qualified at London in 1846 and William in 1844.

veterinarians. It reads thus: "The services having been called for of a couple of veterinary surgeons for duty at the Cape of Good Hope, First Class Veterinary Surg. F. Duck and Veterinary Surg. B. L. Glover, both of the Royal Artillery, have been selected for the duty, and have left to join the field force under the command of Lieutenant-General the Hon. F. A. Thesiger, C.B." (*Vet. Jl.* June, 1878, p. 430).

It will be observed that both were attached to the R.A. Since the Army Veterinary Department was formerly established on April 22nd, 1878, it is evident that from this date they became members of the A.V.D. and fell under the control of the Principal Veterinary Surgeon, James Collins.



NOTES

THE HORSE-SICKNESS

AT THE

CAPE OF GOOD HOPE, IN 1854-'55:

COMPILED BY PERMISSION OF HIS EXCELLENCY THE GOVERNOR FROM OFFICIAL DOCUMENTS,

BY

T. B. BAYLEY.

CAPE TOWN
SAUL SOLOMON & Co., STEAM PRINTING OFFICE.
LONGMARKET-STREET.

1856.

Fig. 8.

TITLE PAGE OF BAYLEY'S NOTES ON THE HORSE SICKNESS AT THE CAPE OF GOOD HOPE IN 1854-55.

This is the earliest copy of a publication printed in South Africa containing a report by a veterinary surgeon. In point of fact it contains reports by two veterinarians, Dr. G. A. Hutton, who was also an army surgeon, and W. J. Kingsley. See Fig. 9.

Soon after their arrival, Duck was attached to the Frontier L.H., and Glover performed general duty. After the Ninth Kaffir War, the F.L.H. proceeded to Sekukuniland, Eastern Transvaal, travelling through Kokstad, Pietermaritzburg and Newcastle. Duck's autograph and obituary appear in the *Jl. S.A.V.M.A.*, IV. (3), 1933 and V. (3), 1934, respectively.

As Basutoland had become part and parcel of the Cape Colony in 1871, the Colonial Government was responsible for the suppression of the rebellions of 1879 (Moirosi) and 1880-81 (Basuto), as well as one which occurred in the Transkei in 1880. These are summarised in Chapter V.

An event of veterinary importance was the appointment in 1876 of Professor W. C. Branford of Edinburgh as Colonial Veterinary Surgeon. A few particulars concerning his career appear in Chapter V.

(b.ii). VETERINARY AFFAIRS IN THE ORANGE RIVER SOVEREIGNTY.

As the Dutch, prior and subsequent to 1836, settled north of the Orange River, so did their power increase and that of the local chiefs decline. British policy, not being favourable to the creation of independent territory on the border of the Cape Colony, seized the opportunity in 1843 of concluding alliances with the Griqua chief Kok and the Basuto chief Moshesh ([56]). In this way authority over the territory north and west of the Orange River and Drakensberg respectively was secured.

When in 1845 some Dutch farmers defied Kok, the British naturally were bound to support the Griqua chief, and in a skirmish at Zwart Kopjes ([57]) on May 2nd the emigrant farmers were defeated by a mixed force under Lieut.-Col. Robert Richardson of the 7th Dragoon Guards. (Theal VI., p. 428).

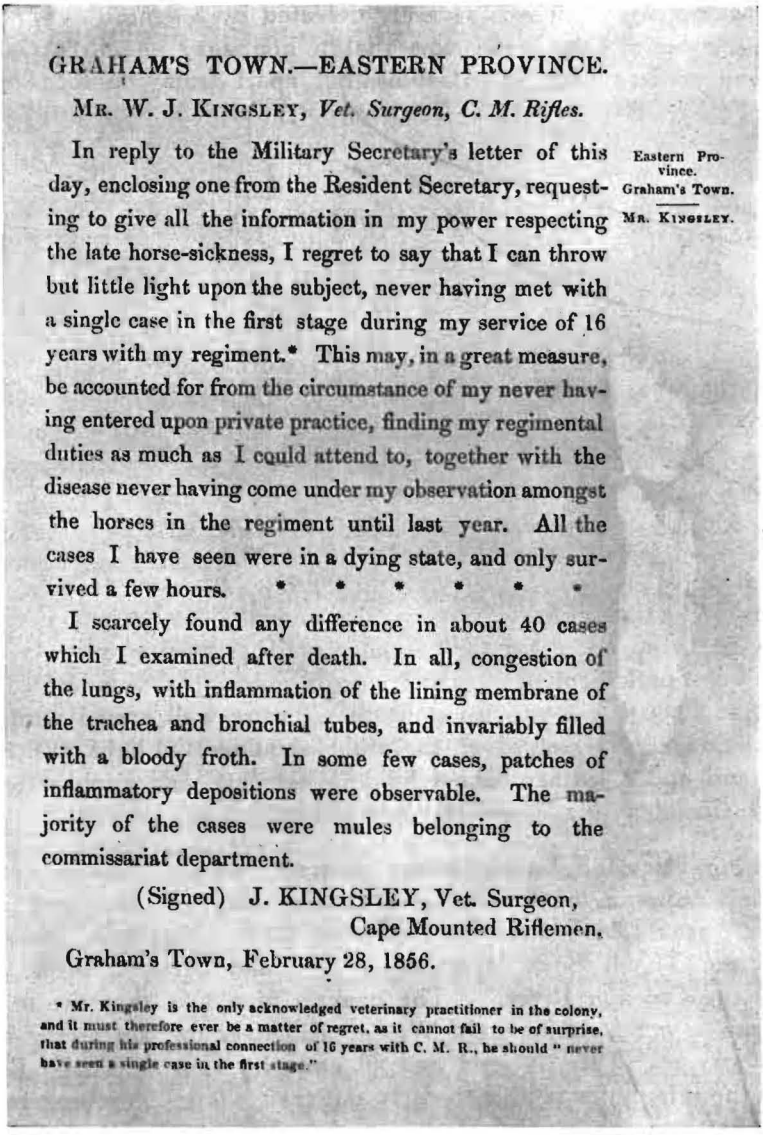
The Governor, Sir Peregrine Maitland, attempted to effect a settlement by encouraging the Griquas to remain south of the Riet River and the farmers to settle north thereof. To this end Major H. D. Warden, with a detachment of C.M.R. established his headquarters as resident at what is to-day Bloemfontein.

Matters however, did not improve since the government was weak and the people impatient. Sir Harry Smith, who had assumed the governorship in 1847, thereupon decided to abolish the Treaty States, and in 1848 proclaimed the territory between the Vaal and Orange Rivers eastward to the Drakensberg as the Orange River Sovereignty. The

([56]) In the following year a similar treaty was arranged with the Pondo chief, Faku.
([57]) Zwart Kopjes is about 5 miles from Touwfontein, which is a farm about 30 miles north-east of Philippolis (Fauresmith district).

Sovereignty thus included not only the present Orange Free State, but also Griqualand West (now part of the Cape Province), and Basutoland.

The proclamation placing the country under British rule immediately caused those emigrant farmers not desiring to become British subjects to organise under Commandant Andries Pretorius. Major



GRAHAM'S TOWN.—EASTERN PROVINCE.

MR. W. J. KINGSLEY, *Vet. Surgeon, C. M. Rifles.*

Eastern Province. Graham's Town. MR. KINGSLEY.

In reply to the Military Secretary's letter of this day, enclosing one from the Resident Secretary, requesting to give all the information in my power respecting the late horse-sickness, I regret to say that I can throw but little light upon the subject, never having met with a single case in the first stage during my service of 16 years with my regiment.* This may, in a great measure, be accounted for from the circumstance of my never having entered upon private practice, finding my regimental duties as much as I could attend to, together with the disease never having come under my observation amongst the horses in the regiment until last year. All the cases I have seen were in a dying state, and only survived a few hours. * * * * * *

I scarcely found any difference in about 40 cases which I examined after death. In all, congestion of the lungs, with inflammation of the lining membrane of the trachea and bronchial tubes, and invariably filled with a bloody froth. In some few cases, patches of inflammatory depositions were observable. The majority of the cases were mules belonging to the commissariat department.

(Signed) J. KINGSLEY, Vet. Surgeon,
Cape Mounted Riflemen.

Graham's Town, February 28, 1856.

* Mr. Kingsley is the only acknowledged veterinary practitioner in the colony, and it must therefore ever be a matter of regret, as it cannot fail to be of surprise, that during his professional connection of 16 years with C. M. R., he should "never have seen a single case in the first stage."

Fig. 9.

REPORT ON HORSE-SICKNESS BY W. J. KINGSLEY, C.M.R.

It will be noted that both "Rifles" and "Riflemen" are used in the title C.M.R. See Fig. 8.

Warden with a small garrison of C.M.R. was forced to leave Bloemfontein (July 20th, 1848); but within six weeks the energetic governor (Sir Harry Smith was at Capetown) had not only defeated the Dutch at Boomplaats—Edenburg district—(August 29th), but had also reached Bloemfontein (September 2nd). Major Warden was again appointed resident, and his difficulties, now with the Basutos, were such that on June 30th, 1851, a force of Imperial troops, farmers and native levies, under Major Donovan, was severely defeated by Moshesh at Viervoet. Sir Harry Smith's intention was that a boundary should divide the European settlers from the Basutos, but apart from the fact that no agreement could be reached, the government lacked troops to enforce order. Worse still, not only was the Eighth Kaffir War (1850-53) in progress and thus no reinforcements could be sent north of the Orange River, but the disaffected farmers allied themselves with Moshesh and thus were left unmolested by Basuto cattle-raiding bands.

Early in 1852 Sir George Cathcart succeeded Sir Harry Smith as governor, and as soon as the situation along the eastern frontier of the Cape Colony warranted, he decided to restore British prestige in the Sovereignty. Accordingly in November Cathcart's force concentrated at Burghersdorp and consisted of "two guns and four rocket tubes R.A., a few sappers and miners, two squadrons each of the Regiment (*i.e.* 12th Lancers) and C.M.R. and two weak infantry brigades. About 2,500 men in all and 150 transport waggons." (Tylden, 1933). See Fig. 6.

Tylden adds that the cavalry numbering 202 rank and file (12th Lancers) and 250 C.M.R., "were well mounted, the Cape horses of the period being noted for their quality and hardihood, and were very good over rough ground." The Basutos "riding a wonderful stamp of 14 hand pony . . . and using saddles," were well armed with good flintlock muskets (slung over the right shoulder) a light axe in the right hand and a leather bucket holding assegais, and knobkerrie over the left shoulder.

The cavalry left Burghersdorp on the evening of November 28th, 1852 and crossing the Orange and Caledon Rivers, reached Platberg Mission (near Ladybrand) on December 13th. This was "about 20 miles from Thaba Bosiu, their objective," and between these points flowed the Caledon River. "The general idea was that the infantry . . . were to move round the S.W. end and over the top of the Berea, the cavalry round the N. end and all unite in front of Thaba Bosiu." While the infantry was able to carry out their share of the undertaking with slight loss, the cavalry encountered severe opposition on the Berea (December 20th) and were compelled to retreat. Approximately 4,000 head of cattle were captured, but in the retreat 27 lancers and 5 riflemen were killed.

Sir George Cathcart, realising that Moshesh was a more formidable adversary than he had anticipated, discontinued the campaign. Two years afterwards the Orange River Sovereignty was abandoned by the British Government.

Lungsickness was at this time raging throughout the country and one of the first measures taken in 1854 by the new Republican Government of the Orange Free State was to pass legislation against the spread of infection.

Fig. 10.

OFFICERS AND NON-COMMISSIONED OFFICERS OF THE (IMPERIAL) CAPE MOUNTED RIFLES (1827-1870).

(Taken between 1861-70).

Top Row:—Sgt.-Major McMahon.

Middle Row:—Lt. Harvey, Capt. Hales, *Vet. Surg. Paton,* Maj. Morant, Qr.-Mr. Sartus, Lt. Pote, Riding Master Morris.

Seated:—Lt. Collins, Capt. Boyes, Maj. McDonnell, Lt. Brabant, Capt. W. Currie, Lieut.-Adjt. Pasley.

(Photo : Dr. A. W. Burton, Kingwilliamstown).

The Orange Free State retained its independence until 1900, and no veterinary surgeon can be traced there until the outbreak of rinderpest in 1897. Basutoland, in order to escape annexation by the Free State in 1868, accepted British protection the same year, later (1871) being administered by the Cape Colony. Two rebellions which followed are summarised in Chapter V. Griqualand West became incorporated in the Cape Colony in 1880.

(b. iii). Veterinary Affairs in Natal.

As far back as 1824, horses were introduced from the Cape Colony by Lieut. F. G. Farewell (Theal. VI., p. 297). The period of the Republic of Natalia (1840-42) saw the development of stock farming, and during the siege of Durban in May and June 1842, Capt. T. C. Smith slaughtered his horses to make *biltong*. Of particular interest, however, during the pre-veterinary days of Natal was the historic ride of Dick King to Grahamstown in order to obtain reinforcements for the besieged garrison. Although the third of the famous rides of South African history ([58]), King's feat is the best known probably both on account of its dangers and for its consequences.

Fig. 12.
THE KING'S DRAGOON GUARDS AT RORKE'S DRIFT ON MAY 20th, 1879.
Photograph lent by Mr. E. C. Chubb from the "Old Durban Collection."

Eyre (1932) has collected the stories of the journey, so all that need be stated is that mounted on *Somerset*, a bay with black points, and accompanied by a native Ndongeni, for part of the way, King succeeded in his undertaking. He left Durban on the night of May 25th, 1842, and covered the 600 odd miles in ten days.

In 1855 lung-sickness entered Natal, causing "enormous loss to the settlers" which "induced them to turn their attention to breeding

([58]) (a) Major Fraser's ride from Grahamstown to Capetown, a distance of 600 miles, in February, 1819, for succour, and (b) Col. H. Smith's magnificent ride (Jan., 1835) in the reverse direction in six days, while speedier, were not associated with so many perils.

B L GLOVER (1848-1904)
(*Vet Jl* May, 1904).

FRANCIS DUCK (1845 1934)
(Smith's *History of the R.A.V.C.*)

ROBERT MOORE (1851-1913).
(Editor, *Vet. Rec.*)

C. PHILLIPS (1851-1895).
(*Vet Rec.*, June 9th, 1934)

J D LAMBERT (1835-1905)
(*Vet Jl.*, May, 1905).

Fig. 11.
ARMY VETERINARY SURGEONS IN THE ZULU WAR, 1879.

woolled sheep which were found to thrive . . . on the highlands." (Theal, VII., p. 251).

In 1870 redwater appeared in Natal having been introduced from Zululand. So severe was the mortality that in 1873 a commission was appointed to investigate the disease. The commissioners were Dr. P. C. Sutherland, Dr. G. Lindsay Bonnar, J. W. Winter, M.R.C.V.S., and J. D. Nicholson. Arising from the report of the commission (published in *Natal Government Gazette* under Govt. Notice 32 of 1874) the first state veterinary surgeon, Samuel Wiltshire was appointed on 28/10/74, his designation being Colonial Veterinary Surgeon.

James Winter was apparently the first veterinary surgeon to settle in Natal but the date of his arrival is not known. Details regarding both his and Wiltshire's careers appear in Chapter V.

The first military veterinary surgeons were First Class V.S. Francis Duck and V.S. B. L. Glover, who had both served in the Ninth Kaffir War in the eastern Cape Colony, and passed through Natal on their way to Sekukuniland in 1878 with the Frontier L.H. After the Second Sekukuni War (October 1878) Duck proceeded to Utrecht (then in the Transvaal), and Glover returned to Natal.

In June 1878 there was published by direction of the Lieutenant-General (see Government Notice No. 192, *Natal Government Gazette* of June 25th, 1878) a report on horse-sickness by Wiltshire. He identified the disease as " anthrax fever resulting from the action of a poisonous agent ingested with the food." (*Vet. Jl.*, VIII., p. 97). There also appeared a pamphlet, by Veterinary Surgeon Glover, entitled " Suggestions for the General Management of Horses and Mules while on Field Service in Natal and the neighbouring Countries, with Notes Concerning their More Common Ailments." (*Vet. Jl.*, VIII., p. 97). Norris-Newman, C.L. (1880), states (p. 13) that a list of prescriptions was appended. The same authority also informs us that this pamphlet was one of three publications issued to the troops prior to the Zulu War 1879, the other two being *The Zulu Army,* and *Regulations for Field Forces in South Africa.* The last named, among other particulars, contained rules as to " horses, sick horse and remount depôts . . . . cattle and other prizes . . . " Glover mentions not only horse-sickness, but glanders in horses and mules, and lung sickness and red-water in oxen. He believed, influenced no doubt by Wiltshire, that horse-sickness was akin to anthrax, in fact he called it anthrax fever. Glanders, he stated, was " at all times more or less prevalent in Natal," and lung sickness was also to be " met with all over the Colony." Red-water, he added, was " prevalent between November and April . . . in most parts of Natal, the greatest mortality occurring along the principal highways."

Then came the Zulu War (Curson 1935), which may be divided into two phases, (a) the initial, from January to March 1879, and (b) the final, from April to August 1879. Duck was attached to the Fourth Column based on Utrecht and Glover was apparently veterinary surgeon to the Third Column, which, later advancing into Zululand met with disaster at Isandhlwana, on January 22nd. Wiltshire, in the meantime, was employed with the remount department, so there were two army veterinary surgeons for a force of 18,000 men with several lines of communications and using probably 15,000 animals.

Realising after Isandhlwana the need for reinforcements and reorganisation generally, troops were brought from oversea, and among

Fig. 13.

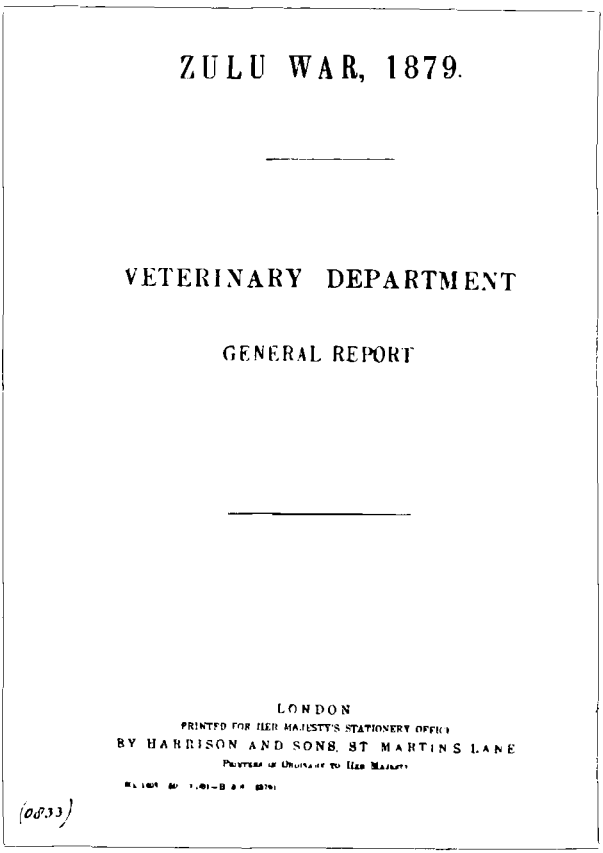
THE BATTLEFIELD OF ISANDHLWANA, ZULULAND, WHEN VISITED BY THE 17th LANCERS ON MAY 21st, 1879.

The view is a composite photograph lent by F. Struben, Esq., Pretoria.

these were two cavalry regiments, the 1st King's Dragoon Guards (V.S. Longhurst) and 17th Lancers (V.S. J. D. Lambert). With this additional strength, the final stage of the campaign commenced, only two invading columns (Divisions I and II) being formed. Accompanying the reinforcements was P. V. S. Gudgin with twelve veterinary surgeons who, with Longhurst and Lambert, brought the number of army veterinarians to fifteen. It was the first occasion the Army Veterinary Department had functioned as such in war, and its creation was

amply justified. The following veterinary surgeons participated :— P.V.S. T. P. Gudgin (headquarters at Pietermaritzburg), F. Duck, W. Burt, G. H. Fenton, B. L. Glover, W. R. Hagger, M. F. Healy, T. A. Killick, R. Moore, J. W. A. Morgan, C. Phillips, F. Raymond, W. B. Walters ([59]), and S. Longhurst and J. D. Lambert.

The K.D.G. landed in Durban on April 9th, 1879, from England,



ZULU WAR, 1879.

VETERINARY DEPARTMENT

GENERAL REPORT

LONDON
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE
BY HARRISON AND SONS, ST MARTIN'S LANE
Printers in Ordinary to Her Majesty

(0833)

Fig. 14.

TITLE PAGE OF P. V. S. GUDGIN'S GENERAL REPORT, VETERINARY DEPARTMENT, ZULU WAR, 1879.

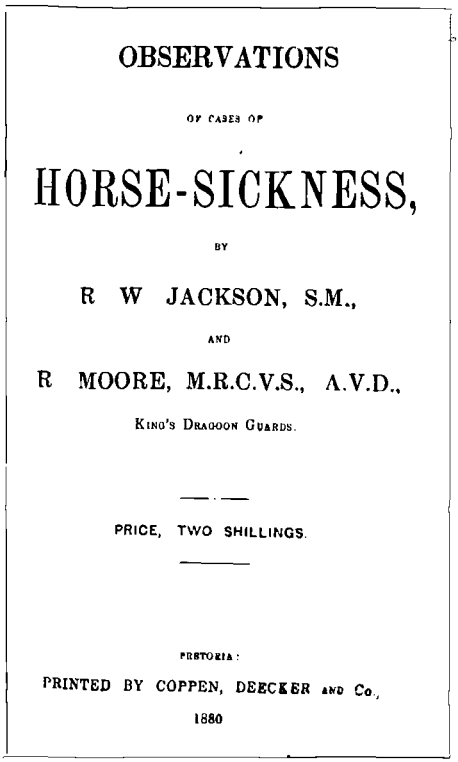
This was the first departmental report issued by the Army Veterinary Service in connection with a South African Campaign.

325 officers and men and 270 horses being aboard the *Egypt*, and 324 officers and men and 267 horses being on the *Spain*. The 17th Lancers also came from England, 317 officers and men and 263 horses being on the *England* which disembarked on April 6th, and 305 officers and men and 264 horses being aboard the *France* which arrived on April 11th.

([59]) Walter's autograph may be seen in *Jl. S.A.V.M.A.*, IV. (3) 1933. It is not clear whether W. Gladstone and J. G. R. Rayment served in the campaign.

The mortality among the horses of the 17th Lancers during the voyage was 5 and 6 respectively. The cavalry was attached to Division II and thus proceeded to Dundee.

Smith (p. 179) states that the Zulu War "demonstrated the rottenness of the contract (shoeing) system," for it was impossible to drag "heavy forge carts with an army over unmade roads" and to forge "shoes in the field in sufficient numbers to meet wear and tear" (60). Primarily as a result of the Zulu, Afghan, and Egyptian campaigns army reorganisation in the 'eighties produced the more efficient Army Remount Department.



OBSERVATIONS

OF CASES OF

HORSE-SICKNESS,

BY

R W JACKSON, S.M.,

AND

R MOORE, M.R.C.V.S., A.V.D.,

KING'S DRAGOON GUARDS.

PRICE, TWO SHILLINGS.

PRETORIA:

PRINTED BY COPPEN, DEECKER AND Co.,

1880

Fig. 15.

TITLE PAGE OF FIRST PROFESSIONAL PUBLICATION IN THE TRANSVAAL.

Compiled as a result of experience in the Third Sekukuni War, 1879. The cover was maroon, contained 14 pages and measured 8 x 5-4/5ths inches.

Gudgin (1881) issued an interesting general report on the campaign, and although he was granted a Good Service Reward of £50 *p.a.* in 1880, no war honours "fell to the Veterinary Department" (Smith, p. 168).

(60) After a long struggle machine-made shoes and nails and cold fitting, if necessary, were adopted in the Bechuanaland Expedition of 1884.

The 17th Lancers after the campaign proceeded to India leaving their horses with the K.D.G., but the K.D.G. performed garrison duty both in the Transvaal and Natal, finally leaving for India in October 1880 (61).

At the end of 1880 occurred the outbreak of the First Anglo-Boer War, which is best considered from two aspects, (a) the Transvaal, where several British garrisons were besieged, and (b) the Natal, where efforts were made to relieve the various centres. On the outbreak of hostilities there was still a detachment of the K.D.G. under Major Brownlow in Pietermaritzburg, and this at once proceeded to the Natal-Transvaal border. It was immediately evident that cavalry reinforcements were necessary, but Sir George Colley, now G.O.C. Natal and Transvaal, instead of awaiting fresh troops at his base, Newcastle, pushed on towards the border, hoping to relieve Standerton by January 20th, 1881. The consequences, Laing's Nek, (28/1/81), Ingogo (8/2/81), and Majuba (26/2/81) are well known.

Four cavalry regiments were sent to Natal, the 15th Hussars arriving at Durban on January 25th, 1881, the 6th Dragoons at the end of February, the 14th Hussars in March and the 7th Hussars on April 4th (62).

The 15th Hussars, whose veterinary surgeon was C. W. Gillard, had arrived from Meerut without horses, which were accordingly purchased in Northern Natal. The railhead was then at Pietermaritzburg. "Forming part of General Colley's force the regiment was on escort duty, until the night of February 26th, when the General moved out of camp to occupy Majuba Hill . . . A troop of the 15th Hussars went out the following morning to escort rations, and these were only in time to hear of the disaster which had befallen those on the hill, and to be almost surrounded themselves, when a signal was received from camp to retire at once. The retreat had to be carried out under very heavy fire at close range, and one or two of our own covering artillery shells falling among the horses . . . caused some to stampede . . ." (*Regimental History of the 15th/19th Hussars*, Northern Army Press, Risalpur).

The remaining three regiments were accompanied by their horses, the 6th Dragoons having voyaged from Woolwich in the steamships *Queen Ararat* and *Hankow*. Particulars regarding the 7th Hussars are provided by Capt. Adrian Jones (1933, pp. 44-45), veterinary surgeon of the regiment. He gives a good description of the voyage to Natal in 1881 as follows: "We sailed on the S.S. *Nemesis* and this, curiously enough, is the only ship's name that has remained in my memory,

(61) A detachment under Major Brownlow remained in Pietermaritzburg.

(62) The 7th Hussars arrived *after* the end of the period dealt with in this publication but to round off the year 1881, the information is included here.

perhaps because we had so much trouble on the journey. Fifty years ago boats had not yet reached the stage so near perfection they have arrived at to-day, and mischance was never very far off. When we reached the tropics our engine went wrong, consequently there was very little air from the windsails and large numbers of horses placed near the engines died from heat . . . On the heels of the first crisis came a second, not quite so bad this time, because we were nearly out of tropical waters, but it was sufficiently serious for the Captain to call all the officers together and ask whether they thought it best to put into St. Helena for water. As there were so many horses and men on board, the general opinion was that we must not risk the water shortage that threatened and was likely to occur if we went straight ahead to the Cape. So we put into St. Helena and set trouble out of reach." After transferring to another steamer S.S. *Calabria* at Capetown, Durban was reached and owing to a heavy swell, " landing was both laborious and difficult. Every horse had to be hoisted up and placed in a surf-boat and then had to be battened down to get through the rolling water and past the Bar."

Further details regarding the voyage (letter P/4 of February 15th, 1932, from Officer Commanding 7th Hussars, Aldershot) are as follows : " Headquarters with A.C.D.E. and H Troops, consisting of fourteen officers, one-hundred-and-eighty non-commissioned officers and men and two hundred horses, sailed in the S.S. *Calabria* from Kingstown, Ireland, on 26th February, 1881. Three detachments, consisting of three officers and one hundred non-commissioned officers and men, proceeded to Hounslow, Colchester and Aldershot, respectively, to take over remounts from the 3rd, 4th and 11th Hussars, and embarked at London on the S.S. *Nemesis* and S.S. *France*. The *Nemesis* proceeded to Kingstown to embark a detachment of the Regiment which was awaiting her there. The latter vessel sailed for South Africa on February 25th, 1881. The remainder of the Regiment, under the command of Major Francis Massy Drew, embarked on the *Nemesis* on February 27th at Kingstown.

The *Calabria* arrived at Port Natal on April 4th, having lost eight horses on the voyage. The *France* arrived there on the same day. The engines of the *Nemesis* broke down after she had been at sea for a few days and both men and horses were exposed to extreme heat, in consequence of which thirty-nine horses died. The *Nemesis* at length reached Cape Town on 22nd April. Here the troops and horses were transhipped to the *Calabria,* which vessel had returned from Natal after landing the headquarters. The *Calabria* then sailed for Port Natal, where she arrived on April 25th.

On arrival, the Regiment encamped on the Eastern Vlei, Durban, and when the horses had recovered from the effects of the voyage, proceeded to Pinetown, again going into camp.

The 7th Hussars did not take part in any activities and beyond the fact that they were inspected on two occasions, once on 22nd November, 1881 by Brigadier General Drury Lowe, Inspector General of Cavalry, and the second time on January 7th, 1882, by Lieut. General The Hon. L. Smyth, Commander-in-Chief in South Africa, there is nothing to record."

Except that the 14th Hussars arrived from India, no details are available concerning the voyage.

The 14th and 15th Hussars remained in Natal until November 1881, when the former returned to India and the latter proceeded to

ADRIAN A. JONES (1846-1907).
(*Daily Mirror* 26/9/29)
Autograph taken from letter of October 17th, 1934.

WM. PALLIN (1843-1907).
(*Vet. Jl.*, July, 1907).

Fig. 16.
ARMY VETERINARY SURGEONS, FIRST ANGLO-BOER WAR, 1880-81.

England after an absence of 12 years. The 7th Hussars remained in Natal until March 1882, when it returned to England but the 6th Dragoons did not leave South Africa until 1890.

Smith (p. 258) gives the names of eleven veterinary surgeons who participated in the campaign, but the names require confirmation. He lists Gudgin, T. P. Lambert, J.D. Reilly (it should be James, *not* C. G.), Durrant, G., Jones, A. A., Gillard, C. W., Pallin, D. C., Rutherford, C.,

Caldecott, T., Duck, F., and Glover, B. L. It would appear, however, that V.S. Gillard (15th Hussars) was the only member of the profession at the front. Some of the men mentioned by Smith, *e.g.*, Gudgin and Glover were certainly not present, while arriving later were Findlay, J., Pallin, W., and Sartin, W. D., names not mentioned by Smith.

From 1881, the A.V.D. was represented in South Africa without a break until 1914, the first P.V.S. being J. D. Lambert who after ten months was succeeded by Senior Veterinary Surgeon Duck. Previous to this Gudgin was P.V.S. until the end of 1879. He was succeeded by S. Longhurst for a few months in 1880, but by the end of the year there was no Army veterinary surgeon in South Africa. Longhurst in India in 1883 won a gold medal presented by Col. Roddy, V.C., for the best practical essay on "African horses."

(b. iv). Veterinary Affairs in the Transvaal.

Between the dates of the recognition of the independence of the Transvaal (Sand River Convention, January 17th, 1852) and the First Occupation by Sir Theophilus Shepstone (April 12th, 1877) there is little to record of veterinary interest. During that period two measures were promulgated against pleuro-pneumonia of cattle, *viz.*: General Pretorius' Proclamation of 1854 and Law 3 of 1870. Further, as a consequence of the First Sekukuni War (June 1876—February, 1877), it was decided to defend the line of the Steelpoort River with a party of volunteers (Lydenburg Volunteer Corps) based on Fort Burgers. Aylward (1878) states that "by December 1st, (1876) of sixty horses that had reached us, (*i.e.*, at Fort Burgers) twenty-two were already dead of horse-sickness; a few had been stung by the fly in Olifantspoort Nek, these had also died."

Within a year of the British Occupation, a fresh attempt (Second Sekukuni War, March 1878—October 1878) was made to subdue Sekukuni, and it was this campaign that brought the first two veterinary surgeons to the Transvaal. These were First Class V.S. F. Duck, and V.S. B. L. Glover, who had both served in the Ninth Kaffir War. The former, later Sir Francis Duck, in a private communication, mentioned that in the Sekukuni Campaign "we lost heavily from horse-sickness."

The year 1878 was a notable horse-sickness year, military movements in low-lying country both in Natal and Transvaal being the chief contributing cause. Indeed, the date 1878 should be regarded as a landmark in South African veterinary history, for in this year no less than three reports on horse-sickness were issued. The first was drawn up by a board of three officers (*Vet. Jl.* VII., p. 100) which met at Pretoria by order of General Thesiger "to report upon a fatal disease among horses there." As neither the Board nor the witnesses possessed any veterinary knowledge, not even "Mr. Wood, farrier and acting veter-

inary surgeon, whose treatment of the disease was specific" being examined, the report was of little value. It was stated, however, that "the percentage of deaths among the Army horses was high; in one lot of sixty-nine, as many as twenty-three had succumbed between February 9th and April 8th." Needless to say, "the Board could not arrive at any conclusion as to the origin of the malady, nor how to prevent it, considering that of twenty-one deaths, thirteen of the horses had been stabled." (Curson 1934).

Sekukuni, having sucessfully resisted the authorities in 1878, another attempt (Third Sekukuni War, October-December1879) was made to defeat the chief after the Zulu War. The campaign, this time successful, is noteworthy for several reasons. Veterinary Surgeon R. Moore, K.D.G. Pretoria, volunteered for the front in order to gain experience with horse-sickness. His report was published (*Vet. Jl.* X, p. 320—1880) and along with this a booklet on horse-sickness by Moore and Jackson was issued. This publication is of historial interest being the first veterinary article published in the Transvaal. See Fig. 15. The losses from horse-sickness were exceedingly heavy. "The Transvaal M.R. out of 200 horses lost 133 between October 1st 1879 and January 29th, 1880. The Border Horse lost 49 out of 180 between October 1st and December 31st. The Lydenburg Rifles had only 64 horses and of these 39 perished in the same interval. The Transvaal Artillery were more fortunate, as they only lost one horse out of 45, between October 1st and December 13th; while the Transvaal M.P. between January 1st and 29th lost no fewer than 38 out of their number—127. Thus out of a total of 638 no less than 260 succumbed to this plague alone during active operations." (*Vet. Jl.* XI., p. 319, 1880). It was stated in a former paper (Curson 1934), that a squadron of the K.D.G. participated in the campaign. The headquarters of the regiment marched to Utrecht (then Transvaal) from Conference Hill at the end of August 1879. There it remained until October 1st, when it transferred to Wakkerstroom. In the meantime detachments were stationed at Pretoria, Heidelberg and Middelburg, but "there is no trace of the King's Dragoon Guards taking part in the Third Sekukuni War" (letter P/157 of 28/9/34 from O.C., K.D.G., Cairo).

It may be mentioned here that desertion was of constant occurrence at this time. The soldiers, many of whom had been on active service for many years, realised that prospects were much better in civil life. Lady Bellairs (*The Transvaal War* 1880-81, p. 34) gives an example concerning the K.D.G. where an officer crossed the Transvaal-Orange Free State border to attend a race meeting at Harrismith. One of his horses having cast a shoe, he stopped at a smithy and recognised the farrier as a deserter who left the regiment a few weeks before. The officer's horse was shod, but a heavy price had to be paid for the favour!

The final event to be referred to here is the First Anglo-Boer War (December 1880—March 1881). The campaign is divided into two phases, the Natal already described and the Transvaal, consisting of the sieges of British garrisons at Pretoria, Potchefstroom, Rustenburg, Lydenburg, Wakkerstroom, Marabastad, and Standerton.

Information concerning the sieges has already appeared in print (Curson 1934), but a few details will be added regarding the cavalry. On the outbreak of hostilities there was still a detachment of K.D.G. under Major Brownlow in Natal and this at once proceeded on active service. Of the four cavalry regiments sent from Great Britain (6th Inniskilling Dragoons and 7th Hussars) and India (14th and 15th Hussars), none entered the Transvaal, as with the exception of the 15th Hussars ([63]), which reached Durban on January 25th, 1881, all arrived after the defeat at Majuba (February 26th, 1881). At this time there was not a single Army veterinary surgeon in the Transvaal, the last having been Robert Moore, whose regiment the K.D.G. had left South Africa in October, 1880. In fact until the arrival of Arnold Theiler in 1891 and the visit of Capt. Horace Hayes in 1892, no veterinarians can be traced as having been in the Transvaal since Moore's departure.

(c) Conclusion.

The years 1840-81 are of particular importance for they cover the period of greatest unrest in the history of South Africa. Then as a result of the subsequent settlement and prevalence of stock diseases, more attention is paid to civil matters. Investigation of animal diseases, and improvement of stock are examples, the Cape horse being especially popular.

The Army veterinary surgeon becomes more evident owing to the demand for cavalry and more efficient transport. Whereas no veterinary surgeons can be traced in the Fifth and Sixth Kaffir Wars, two are employed in each of the following Kaffir campaigns, 15 in the Zulu War and approximately 11 in and after the First Anglo-Boer War. The event of greatest interest is the commencing departmentalisation of the Army Veterinary Service, which in its first campaign, Zulu War, amply justifies its creation. In 1881 departmentalisation was completed.

The first veterinary surgeon to arrive in the Orange Free State was probably Thacker (1852), in Basutoland also probably Thacker (1852), in Natal, Winter (1873), and in the Transvaal, Duck and Glover in 1878.

South African Veterinary literature of professional interest makes its first appearance.

The foundations are laid in Natal and Cape Colony of the civil veterinary divisions. The first private practitioners arrive in Natal and the Cape Colony, and the value of veterinary supervision is recognised by the permanent defence forces of the same two colonies.

([63]) A detachment of the 15th Hussars under Capt. Bullen proceeded to Potchefstroom in 1881, leaving Natal on May 28th and returning on July 4th.

(To be Concluded).

Jl. S.A.V.M.A.,
VI. (3) 1935.

The Submitting of Specimens for Chemical Analysis and the Diagnosis of Poisoning in the Laboratory.

By DOUW G. STEYN, Dr. Med. Vet. D.V.Sc.

It is in many cases a most difficult task to make a definite diagnosis of poisoning in the laboratory from the chemical analysis of specimens submitted and in order to be able to express a definite opinion as to whether or not an animal has died from a certain poison the following information should be available :—

(a) Circumstantial evidence ;
(b) History of the case or cases concerned ;
(c) A detailed description of the symptoms, post-mortem appearance and the treatment applied ; and
(d) The amounts of poison (if the poison is identifiable) present in the gastro-intestinal tract and other internal organs.

Whenever possible the kind of poison suspected should be mentioned as this facilitates the analysis and saves time, trouble and expense.

It is essential that the treatment applied in the case or cases concerned be given in detail. This information is of great value in arriving at a definite diagnosis especially in cases of suspected arsenical poisoning, where the affected animals have been treated with preparations containing arsenic. In South Africa, Cooper's Dip is very extensively used by stock owners in the treatment of ailments in stock with the result that it is frequently very difficult, if not impossible, to ascertain whether or not an animal has died from arsenical poisoning.

In all cases of suspected poisoning the following specimens should be submitted :—

(1) *Cattle, Sheep and Goats.*—1lb. of ruminal contents and 1lb. of abomasal contents in one jar (it is preferable to place the ruminal and abomasal contents in separate jars, although it is realised that it is not always an easy matter to obtain a sufficient number of jars) and 2lb. of liver in another container.
(2) *Horses, Mules and Donkeys*: 2lb. of stomach contents, and 2 of liver in different containers.
(3) *Pigs, Dogs and Cats*: 2lb. of stomach contents, or in case of small animals, the whole stomach with its contents, and 2lb. of liver, or the whole liver, in different containers.
(4) *Birds*: All the contents of the crop and stomach in one bottle, and the liver in a separate container.
(5) *Specimens of materials* suspected of containing the poison.

It is of the utmost importance that each specimen be submitted in a separate container bearing a label indicating the nature of the contents and the address of the sender. If specimens of more than one animal be submitted, these should be placed in separate containers and labelled accordingly. *In no circumstances should samples of stomach contents and liver be submitted in one container.*

It is further of importance that specimens should not be submitted in tins but *only* in thoroughly cleaned bottles, preferably fruit-jars. *No preservatives should be added to specimens intended for chemical analysis.*

Arsenical Poisoning.

In acute and subacute cases of arsenical poisoning specimens of stomach contents and liver should be submitted, whilst in chronic cases specimens of bone and skin (with hair or wool) are required in addition to specimens of stomach contents and liver.

If carcases are exhumed long after the animals have died, specimens of bone, skin, and if available, also stomach wall and/or stomach contents, should be submitted for analysis.

In cases where live animals are suspected to be suffering from arsenical poisoning, specimens of urine (about one pint) and faeces (about 1lb.) should be submitted for analysis. It is essential that the urine and faeces be collected as soon as possible after symptoms of poisoning have set in.

Carbon Monoxide (Coal Gas) Poisoning.

In cases of suspected carbon monoxide (coal gas) poisoning the brain, and blood from the heart or large veins about the heart should be submitted.

Hydrocyanic (Prussic) Acid Poisoning.

In cases of suspected hydrocyanic acid poisoning ("geilsiekte") about 1lb. of stomach contents (ruminal contents in ruminants) should be collected *as soon as possible after death* and immediately be placed in an air-tight fruit-jar. It is advisable to collect the specimen from the centre of the stomach contents, as hydrocanic acid, being a gas, will disappear more quickly from the outer layers of the contents. Specimens of plants suspected of having caused "geilsiekte" should also be forwarded in air-tight fruit-jars.

Malicious Poisoning of Stock.

In cases of suspected malicious poisoning, which may lead to legal proceedings, it is essential that the cases be investigated by a qualified veterinarian in conjunction with the police. If the services of a veterinarian or the police are not available, the owner of the animals concerned

should conduct the autopsy and collect the above specimens in the presence of at least two witnesses. All the specimens collected should be sealed in the presence of the witnesses and handed to the police.

In many cases specimens are submitted in containers (tins, bottles, etc.) the lids of which are sealed with candle-grease, lead, or sealing-wax, which do not bear a distinctive mark, for example, a monogram. It is obvious that the containers should be sealed in such a way that any tampering with the seal may easily be detected. In cases where the person submitting the specimens is not in a position to seal the containers as explained above, these containers should be taken to the police, a magistrate, or the office of a veterinary officer in the company of the witnesses present when the specimens were collected.

It is imperative that the unsealed, or not properly sealed specimens, should at no time be left under the sole supervision of the person in whose interest they are submitted.

Giving Evidence in Cases of Alleged Poisoning.

To veterinarians called upon to give expert evidence these points are of the utmost importance: (a) that questions on matters not pertaining to the special subject upon which he is giving evidence should not be answered; and (b) that no views should be expressed upon a matter about which the witness is not sure.

The information contained in an article "*The Veterinary Surgeon in the Witness Box,*" by Bullock (1935) (1) is of great value to those veterinarians who may be called upon to give evidence in court cases. He discusses the examination of the animal, the rules of evidence, and the desirability of precise definitions, and refers to the following golden rules:—

"Don't argue with counsel."

"Speak slowly, distinctly and audibly."

"Give your replies as far as possible in simple non-technical language."

"Never lose your temper.

The Doping of Race Horses.

In the doping of race horses heroine, cocaine, caffeine, strychnine, alcohol and sugar, either alone or mixed, are used.

It is stated (1935 *Jahresbericht Veterinär-Medizin.* 56 Bd. p 223-224) that heroine, caffeine, cocaine and strychnine are detectable in the saliva from twenty to forty-eight hours after administration, and that these substances administered to horses about one hour before the races can be traced in their saliva up to about two hours after the races.

(1) Bullock, F. (1935) *Vet. Rec.*, 47 : 363.

It is therefore clear that in suspected cases of doping, specimens of saliva (as much as is obtainable) should be submitted for analysis. The technique of collecting a sample of saliva is described by Fitzgerald (1935) ([2]) as follows :—

Syringe Method of Taking Saliva Sample.

Material: One surgical pan, 14 inches long, 10 inches wide and 8 inches deep. Three irrigating syringes, constructed of an ordinary rubber bulb connected to a horse canula, six inches long, ¼-inch bore. The canula should be of nickel or chromium brass. Over the canula a piece of rubber tubing 5/16-inch bore and 3/32-inch wall, should be slipped and fastened to the bulb with a piece of adhesive tape one inch wide. This syringe is easily taken apart and cleaned before use for a second sample. Gauze swabs two inches wide by eight inches long, and of 18 to 20 thicknesses are used.

One 250 cc. graduate.

Procedure.—Everything being in readiness, the horse is brought to the saliva station. The pan, having been thoroughly cleaned, dried and rinsed with distilled water, is covered with a piece of clean gauze. 250 cc. of distilled water in a bottle is kept at hand. Two sterile gauze swabs and a pair of sterile canvas gloves are kept in a paper sack ready for use. 150 cc. of grain alcohol is at hand.

The owner or trainer is notified before the judges stand at the time of dismounting, that his horse is to be tested. The veterinarian then stays with the horse *en route* to the saliva station. If a tongue strap has been used on the horse, it should be obtained and sent in with the sample. If the tongue strap is leather, it can be returned after washing it in the distilled water for the sample.

No one is admitted to the saliva station but the owner, trainer or horse attendant. The 250cc. of distilled water is emptied into the pan. The gloves and gauze swabs are put into water, then wrung out as dry as possible. The gloves are put on and one of the gauze swabs is held in the left hand and the syringe is held in the right hand. The pan is held under the horse's mouth by the owner or trainer at the right of the horse's head. The attendant stands at the horse's left and the veterinarian works directly in front of the animal. The swab in the left hand is inserted back between the molar teeth hanging on to one end. It may help if two fingers of the left hand grasp the ring of the bit. The syringe is filled with the distilled water and inserted well back both inside and outside the dental arch for irrigation. This procedure is continued until chewing on the gauze has stimulated the flow of saliva. This fact can be noticed by the appearance of a great quantity of foam and heavy viscous liquid flowing from the mouth. The horse should be made to chew for at least five minutes while the irrigating is being continued.

The second gauze is then taken from the pan, wrung out well and the entire mouth, including the tongue, wiped, and the gauze dropped into the pan. The groove in the top of the tongue should be wiped last.

The gloves are removed. The syringe and hands are rinsed in the alcohol as it is poured into the pan. Then the entire contents of the pan: gloves, gauze, water, alcohol and saliva, are put into a jar. The jar is labelled and sealed. The owner or trainer is then asked to sign the label; the material is then made ready, as before, for the next sample.

In certain racing clubs in France it is customary to collect specimens of saliva from the horses immediately before the races.

Persons responsible for the doping of horses sometimes administer

([2]2 Fitzgerald, T. C. (1935) *Vet. Med.* XXX (7): 321-2.

atropine to the animals concerned in order to decrease the secretion of saliva, thus rendering the collection of saliva a difficult matter.

It would perhaps be of value to administer a small medicinal dose of pilocarpine hydrochloride in order to stimulate the secretion of saliva. It is essential that a large quantity of saliva be submitted in cases of suspected doping as the amount of the drugs present in the saliva is minimal.

It is difficult to ascertain whether horses have been doped with alcohol or sugar as these substances are frequently given to horses in the normal course of events.

An Account of Two Cases of Dystokia.

By RICHARD CLARK, B.V.Sc., Ermelo.

The following two cases of dystokia may be of interest to veterinarians both on account of their peculiar nature and also because they illustrate the great resistance that cattle have to peritonitis.

The cases occurred in a herd of milking Frieslands which was badly infected with contagious abortion.

Case I.

The history of this subject is as follows :—The cow had, four days previously, shown signs of commencing parturition. These passed off and the animal once more became normal. On my arrival at the farm she was found to be grazing and did not appear to be any different from any other cows that were with her. However, on a closer and more prolonged examination she was seen to raise her tail occasionally and at the same time strain slightly. There was, however, a marked swelling on the left side of the perineum.

On vaginal examination it was discovered that the *os uteri* was slightly dilated allowing the entrance of two fingers, but through the wall outside the vagina and to the left could be felt two feet of a foetus. Dilation of the *os* could not be performed and in spite of further manipulations and attempts to push this foetus back no results could be achieved.

A diagnosis of ruptured uterus was made and destruction was advised.

On post mortem it was found that the foetus was presented in the normal position. Apparently, owing to the failure of the *os* to open,

the two fore feet had not entered the os, but had pressed against the wall of the uterus to the left of the os, forming first a pocket, and finally a complete rupture. The foetal fluids had escaped into the peritoneal cavity.

It would appear that the fall of intra-uterine pressure, due to the escape of the fluids, had resulted in cessation of the uterine contractions.

Case II.

The history of the subject is as follows: This cow had apparently given birth to a dead calf or had aborted an almost full-term calf some three weeks previously. When the owner was pressed for fuller information, he stated that they had never seen the calf but she had returned to her stall one evening, showing all signs of having just calved. The foetal membranes had been got rid of normally and the cow had come into milk. After this, apart from the animal giving colostral milk for a rather prolonged period she had appeared quite healthy. The day before my arrival the animal was noticed to be ill and the owner diagnosed "stiff-sickness"—the day of my arrival the owner realized that labour had commenced and I was called in.

The calf was presented in a normal position, the forefeet were protruding from the vulva and the head had entered the vagina. The cow was in a weak and exhausted condition and the foetus macerated. Decomposition was so much advanced that the skin and claws of the fore-limbs came away when handled and the cranial bones were removed one by one with my fingers. Eventually I removed the calf.

On examining the uterus it was found that this organ was ruptured and coils of the intestines could be felt when the hand was introduced into the abdominal avity through the rent in the uterine wall.

The animal was destroyed and a post mortem examination revealed an advanced gangrenous metritis with peritonitis.

The interesting points of this case are:—

1. The retention of a foetus for 3 weeks without any untoward symptoms and the decomposition of the foetus within the uterus without causing death from toxaemia;
2. the resistance of the cow to peritonitis;
3. the apparently normal clinical aspect of the patient in spite of the advanced state of the internal organs.

BOOK REVIEWS.

A monograph (1) which forms the 6th contribution from the Department of Tropical Medicine and the Institute for Tropical Biology and Medicine of the Harvard University Medical School forms a very valuable contribution to our knowledge of Onchocerciasis. The work is divided into four parts for each of which a different author is responsible.

Prof. Strong contributes Part I, which comprises 132 pages and deals with the history and occurrence of the disease in Guatemala, its epidemiological and endemiological aspects, the life-history and transmission of the parasite, immunity, prophylaxis, and treatment as well as several other aspects of the disease. This part affords very interesting reading and will be welcomed by all clinicians who are interested in this disease from the human aspect. Three species of Simulium are shown to be vectors.

Prof. Soundground is responsible for the second part which occupies 40 pages of the monograph. Here all the species attributed to the genus Onchocerca are morphologically considered and compared and the writer concludes that all true members are very similar to one another and cannot be distinguished from one another by the usual morphological character used in Helminth determinations. Of the 14 supposed species he suggests that only five may be valid, and further suggests that *O. cervicalis* Raillet and Henry, 1910, from the horse be suppressed in favour of *O. reticulata,* Diesing, 1841; that *O. bovis,* Piettre, 1912, from cattle be a synonym of *O. gutturosa,* Newman, 1910; that *O. indica,* Sweet, 1915, from cattle is probably the same as *O. gibsoni,* Cleland and Johnston, 1910; and *O. caecutiens,* Brumpt, 1919. is the same as *O. volvulus* (Leuckart, 1893). *O. armillata,* R. and H., 1909, from bovines he regards as a good species; the meagre descriptions of *O. flexuosa* (Wedl, 1856) from deer, *O. fasciata,* R. and H., 1910, from the Camel, *O. linealis* (stiles, 1892) from Cattle and *O. fulleborni* Hoeppli *et al.,* 1929 from a seal do not allow him to draw any definite conclusions. although he thinks the first three may be same as *O. gibsoni.* He doubts whether the remaining species *O. bambusicolae* Li, 1933 from a bird is correctly placed as an Onchocerca.

In the third part, which occupies 50 pages, Prof. Bequaert discusses the Black-flies or Simulidae with special reference to those found in Guatemala; here the biology of the larval stages and adult flies as well as their characters and distribution are carefully considered,

(1) *Onchocerciasis with special reference to the Central American form of the disease,* by Richard P. Strong, Jack H. Soundground, Joseph C. Bequaert, and Miguel Munoz Ochoa. Contributions from the Department of Tropical Medicine and the Institute for Tropical Biology and Medicine, No. VI. Pp. XIV and 234, Maps 2, Figs. 103, pl. VI. Cambridge: Harvard University Press, 1934.

and a simple and effective method of rearing the adult fly is described. The parasites and enemies of the larvae and adults are also discussed with reference to their possible utilisation in the control of the fly; finally the writer discusses the taxonomy of the family Simulidae and describes and figures six Guatemala species.

In the final part Dr. Ochoa gives some epidemiological facts about Onchocerciasis in Guatemala.

The monograph has been well prepared, the paper, type and illustrations being fully up to the standard of the excellent work produced by these well-known publishers.

R.J.O.

A recent work on Haemodynamometry of the circulatory system ([2]) by Louis Desliens represents the results of original and personal research by the author during his 25 years as a practising veterinarian. The question is certainly not one with which the average practitioner would concern himself overmuch, but the author succeeds in showing that by the application of his simplified methods most useful and interesting clinical data on the circulatory system may be obtained, both in the fields of physiology and pathological physiology. The book is divided into five parts. The first deals with arterial puncture and intra-arterial injections, the ease, safety and uses of which are amply demonstrated. In the second, methods of exploring the circulatory system are dealt with, e.g., determination of blood pressure, and its recording by means of two different techniques.

The third concerns normal physiological studies and throws new light on many of the older notions, e.g., the vasomotor reflexes, the role of muscular contractions in circulatory propulsion, interferences with arterial waves, etc.

The fourth deals mainly with the circulatory system from the pathological-physiological aspect, giving the significance of these changes in various diseased conditions, in particular the arythmias of the horse.

The fifth and last part, is confined almost entirely to pharmacodynamic observations based on the intra-arterial injections of drugs. The methods employed enable one to analyse the cardiovascular effects of drugs under conditions which have never yet obtained, i.e., on the normal standing animal, without inflicting pain and yet without the obscuring effects of anaesthesia or restraint.

A.D.T.

([2]) *Hemodynamometrie arterielle, veineuse, cardiaque,* by Louis Desliens. Pp. 544—8vo., figs. 148; 75 fr. Paris: Vigot Frères, 1935.

NOTES AND NEWS.

The return of Sir Arnold Theiler to South Africa will be welcomed by all veterinarians in this country. Since he retired in March, 1927 he has been living most of the time in Switzerland, his native country and some of us have very pleasant recollections of visits to him and Lady Theiler in Lucerne during overseas trips. He spent some months in Italy, mainly for health reasons, and subsequently made a trip to North Africa, a visit which was of tremendous interest to him from every point of view. He was able to compare the country and its stock diseases with South Africa and its similar problems, to do which he was in a unique position.

About two years ago, Sir Arnold Theiler decided to take up residence in England. His sojourn there was greatly appreciated by his British colleagues and he was able to continue his studies under satisfactory conditions.

Last year he attended the International Veterinary Congress in New York and was able to renew many friendships made during his previous visit. At the close of his American trip, Sir Arnold and Lady Theiler returned to South Africa, where they arrived in December. Both Sir Arnold's daughters are living in South Africa and his elder son will shortly take up a position at Onderstepoort, so we may hope that on this account he may be influenced to remain in South Africa. Since he retired, he has been engaged in the study of bone pathology, and has made very valuable contributions to our knowledge of the subject. He is continuing his work on bone diseases at Onderstepoort, where he has been given a laboratory and all the facilities he requires.

This year two signal honours have been conferred on him, an honorary Doctorate in Science of the University of the Witwatersrand, and the gold medal of the Royal Agricultural Society of Great Britain. The medal was presented to him by General Smuts at the opening ceremony of the Rand Show in April.

Sir Arnold is a striking example of the value of maintaing absorbing interests in retirement and we sincerely hope that scientific and family reasons will induce him and Lady Theiler to make South Africa their permanent home.

* * * *

We have pleasure in recording that Dr. P. J. du Toit, Director of Veterinary Services, has recently been appointed corresponding member of the *Academie Veterinaire de France and the Société de Pathologie Exotique.*

SIR ARNOLD THEILER.

THE ASSOCIATION.

MINUTES OF MEETING OF COUNCIL HELD AT POLLEY'S HOTEL, PRETORIA, ON MONDAY, 27TH MAY, 1935, AT 8 P.M.

Present: Messrs. F. J. Carless, President; H. H. Curson, Vice-President; R. du Toit, Hon. Secretary; P. J. du Toit, P. J. Fourie, A. D. Thomas, C. J. van Heerden, D. G. Steyn, C. Jackson, and M. H. V. Brown, Asst. Secretary.

The President welcomed Mr. Jackson to the meeting as a co-opted member, and read a telegram from Mr. Dickson apologising for being absent.

1. **Confirmation of Minutes of Meeting 22/3/35 and 18/4/35.** The minutes were read and confirmed after an alteration had been made in Item 3 of the minutes of 18/4/35.

Dr. Thomas said that no Assistant Secretary had been appointed, and nominated Mr. Brown. Seconded by Dr. P. J. du Toit. Agreed.

2. **Matters arising out of these minutes.**

(a) **Meeting 22/3/35.**

(i) *Progress of Proposed Govt. Commission.* The Secretary read a letter addressed to the Secretary for Agriculture in which it was suggested to him that some representative body be appointed to go into the whole question of veterinary services in South Africa. No reply to this letter had been received.

The President said that he would probably see the Secretary for Agriculture on the following day, and he was asked to discuss the matter with him.

(ii) *Scales of Pay, Protechnical Section.*

The Secretary briefly outlined the proposals that had been made by the Protechnical Section of the Public Servants Association, for lowering the commencing salaries of veterinary appointments in the service. He said that letters had been written to the Medical and Law Association and although the Law Society was unwilling to appoint delegates to interview our two delegates, the Medical Society had appointed two, and these had interviewed Drs. Thomas and Curson. He read the report of this interview, in which the Medical delegates expressed themselves in entire sympathy with us in disapproving of the proposed scale, and stated that they would take it up in due course with the proper authorities.

Drs. Thomas and Curson had also previously had a meeting with the Executive of the Protechnical Section, but no finality had been reached.

At a later General Meeting of the Protechnical Section it had been agreed that the maximum for qualified officers occupying technical posts in the Civil Service be £700 with an efficiency break at £500.

Dr. du Toit said that this proposal had perhaps been taken too seriously by the Council. He thought that the best procedure to adopt would be to address a letter to the Secretary for Agriculture, informing him of these proposals, with the request that it be laid before the Public Service Commission should the occasion arise.

Dr. Curson pointed out that if we did not protest to the Public Servants Association, the proposal would have gone forward as an unopposed recommendation to the Public Service Commission, and he thought a letter of protest should be sent to the Public Service Association.

The Secretary read a letter of protest addressed to the Chairman of the Protechnical Section of the Public Servants Association, in which it was pointed out that the Veterinary profession was unanimously opposed to the lowering of the starting salary of Government Veterinary appointments, and giving details concerning the responsibilities and nature of work undertaken by Government Veterinary Officers.

The letter was approved, and it was also agreed that it be sent to the Secretary for Agriculture, with a suitable covering letter as indicated above.

The Sub-Committee consisting of Drs. Curson and Thomas and the Secretary was to continue to act in this matter, and Dr. Curson suggested co-opting Dr. Mönnig to the Committee as the latter was the Onderstepoort representative on the Protechnical Section of the Public Servants Association. This was agreed to.

(iii) *Scale of Charges for Veterinarians.* The Secretary stated that he had received several letters from private practitioners asking for a scale of charges for veterinary services.

Dr. Thomas thought that local conditions and individual cases varied to such a large extent that such a scale of charges would be of little use.

The President thought that it would be advisable to draw up such a scale with the idea of possibly extending it at a suitable time to the services performed by Government Veterinary Officers dealing with non-scheduled diseases.

The Secretary said that he had received an old scale of charges drawn up by the Status Committee in 1929, and it was agreed that copies of this scale be submitted to selected veterinarians for their comments, and that the Secretary report to a later meeting.

The Secretary here mentioned that Mr. Horwitz had raised another question in his letter concerning unsatisfactory rates of pay paid by the

S.A.R. to veterinarians in Port Elizabeth. The writer thought that appointments on the same basis as those of district surgeons appointed by the S.A.R. would be desirable and asked whether it would be possible for the Association to approach the S.A.R. authorities in this connection.

Dr. Thomas proposed that this matter be referred to the Status Committee. Dr. P. J. du Toit seconded. Agreed.

(iv) *Letter from Mr. B. Runciman re Names in Press.*

The Secretary stated that he had written to the *Rand Daily Mail* and the Newspaper Press Union concerning this matter, and that satisfactory replies had been received from both, in which they intimated that the practice would be strongly deprecated. The Newspaper Press Union further stated that they would be pleased to be advised of any future happenings of this nature.

The Secretary said that he had recently received cuttings of newspapers containing a press interview with a veterinarian in Durban.

It was agreed that a copy of this press interview be sent to the Newspaper Press Union, and that the Veterinary Board be informed of the fact.

(v) *S.A. Veterinary Board—Publication of Proceedings.*

The Secretary said that he had approached the Chairman of the Board in this connection, and read the reply in which the Chairman stated that the matter would be brought up at the next Board Meeting.

(vi) *S. and T. Rates for Government Veterinary Officers.*

The Secretary asked Mr. van Heerden to state the present position.

Mr. van Heerden said that the matter was now in the hands of the Public Service Commission, and that no progress had been made as yet.

(vii) *Articles by Laymen on professional matters.*

The Secretary said that this referred particularly to an article in *Farming in South Africa* on castration of sheep and said that he had drawn the attention of the Director of Veterinary Services to it.

Dr. du Toit said that he had taken the matter up officially and was still in correspondence with the Department.

(viii) *Capt. Clapham.*

The Secretary asked Dr. du Toit as a member of the sub-committee to state whether any progress had been made.

Dr du Toit said that he had not yet had an interview with General van Ryneveld, but was hoping to have one shortly.

2. (b) **Meeting 18/4/1935.**

(i) *Grant to Mr. Clayton.*

The Secretary stated that a grant of £10 10s. had been made from the Benevolent Fund to Mr. Clayton. This was approved.

3. **Attendance at Council Meetings—Publication.**

The Secretary said that a suggestion had been made that the attendance of council members at meetings be summarised and published in the Journal.

It was agreed to refer this to a later meeting, and also to remind distant Council Members of the rule in the constitution allowing them to appoint proxies to be present at meetings in their place.

4. **Members in Arrear.**

The Secretary said that three members were three years and more in arrear with their subscriptions, and asked if he should proceed with the course provided for in clause 7(b) of the constitution.

It was agreed that a letter be written to these gentlemen first explaining the position, and if they did not pay up then clause 7(b) of the constitution was to be put into effect.

5. **Akiron—Supply and distribution to private practitioners.**

Dr. du Toit explained that the distributing agents had been approached and asked to supply this preparation to veterinarians only. They had referred the matter to their London principals and the latter had replied to the effect that they had given instructions that chemists should supply " Akiron " to veterinarians only, and further that a special label was to be affixed stating that " Akiron " was for the use of veterinarians only.

As the reply was rather ambiguous **Dr. du Toit** stated that he wos taking the matter further with the distributors.

6. **Authorisation of Veterinarians re use of drugs under Public Health Act.**

The Secretary said that this matter had arisen as a result of a letter received from a registered unqualified practitioner who complained that his application for authorisation had been refused, although some ten years ago, he had had permission from the Principal Veterinary Officer to make use of habit-forming drugs.

Dr. du Toit proposed that in view of the fact that this practitioner had completed three years of an academic course the matter be referred to the Veterinary Board, and that all particulars be supplied to them. Seconded by Dr. Fourie. Agreed.

7. **Life Membership—Letter from Legal Advisers.**

The Secretary read the last letter from the Legal Advisers in which they suggested that the constitution of the Association be revised with a view to defining clearly the powers of its council.

A sub-committee consisting of Drs. Thomas and Curson and Mr. Jackson was appointed to go into this matter, with powers to consult the legal advisers.

Dr. Curson suggested that this Sub-Committee should also investigate a constitutional point in that the Medical Association was entitled by an advertisement in the Press to warn their members not to apply for certain advertised positions on account of the unsatisfactory rates of pay, etc., offered. He thought that it would be desirable for our Association also to be empowered to make use of this system.

8. **Expert Witness Fees—Letter from Mr. B. Runciman.**

The Secretary said that he had written to the Secretary for Justice to enquire what witness fees were paid to expert witnesses. He had received a reply in which the Secretary for Justice stated that 15s. 9d. per day was paid to veterinary expert witnesses residing near the court, and £1 1s. to those over 18 miles from the court, whilst to medical expert witnesses residing 18 miles from the court, £1 10s. per day was paid.

It was agreed that the secretary inform Mr. Runciman, and refer the matter to the status committee, if and when, necessary, for further action.

9. **Conveners of Standing Committee—appointment of.**

It was agreed that the Secretary should call meetings of the Standing Committees at which each should elect its convener.

10. **Date of Spring General Meeting, and Papers to be presented thereat.**

It was agreed to appoint a Sub-Committee to arrange this matter, and the following Sub-Committee with power to act, was appointed—Dr. Thomas, Dr. du Toit, Mr. C. J. van Heerden, (and the Secretary).

11. **Date of Autumn General Meeting 1936 and proposal by Mr. Snyman.**

The Secretary said that Mr. Snyman had proposed that the autumn general meeting be held on Easter Saturday.

It was agreed that this matter be left over until the spring general meeting.

12. **Group Insurance Scheme.**

The Secretary said that a proposal had been received from the Legal and General Assurance Society, Limited, for a group insurance scheme to be adopted by the Association.

It was agreed that Mr. Brown go into this matter and report at the next council meeting.

13. **Report of Committee on Horse Breeding.**

The Secretary produced a report from the Horse Breeding Committee, and it was agreed that copies should be typed and distributed to members for discussion at the next meeting. It was also agreed to submit a copy to the Editor for publication in the Journal.

The meeting then terminated at 11 p.m.

Jl. S.A.V.M.A.
VI (4) 1935.

Municipalisation of Milk Distribution.*

By Dr. F. A. DONNOLLY, Medical Officer of Health, and
Dr. J. G. BEKKER, Veterinary Officer, to the City Council of Pretoria.

The problems confronting Municipal Public Health Departments as a result of the Dairy Control Board's scheme of distribution of surplus milk to school children afford a convenient opportunity for discussing the control of milk supplies in urban centres. In so doing we must consider not merely the immediate present, but should plan ahead allowing for expansion of these centres during the next decade or so.

One of the essential features of the Dairy Board's scheme is that all milk issued to school children under the Government subsidy must be pasteurised. The immediate questions that arise are :—

(1) How and where is pasteurisation to be carried out ?
(2) Does pasteurised milk have the same food value as raw milk ?
(3) Is pasteurisation of an "inferior" milk going to make it a "good" milk ?
(4) Is pasteurised milk disease-free ?
(4) How is the distribution of milk to school children to be arranged ?

The idea of distributing milk to school children is certainly not novel, numbers of schools in South Africa being at present supplied with milk, either privately or through Provincial funds, and a similar project on a national scale has been in operation in England for some years; and has resulted in marked beneficial results from the point of view of health of scholars.

The scheme, however, of distributing "surplus" milk to school children is rather unusual, the feeling generally being that the child should get the best milk, not as it were, the "left over" supply, although this, if properly produced and distributed, can be quite adequate.

Properly produced and distributed milk is recognised as an almost ideal food, and, as such, should therefore be available to everyone at reasonable cost, towards the realisation of which end, for example, elaborate propaganda is being conducted in Great Britain by the Milk

* Paper read before the Municipal Association of the Transvaal at Springs, 8th October, 1935.

Marketing Board. This valuable animal product may, however, serve at the same time, as a means *par excellence,* for the transmission to human beings of the causal factors of a number of diseases, to prevent which, and to ensure that the public obtains a nutritious supply of milk, special by-laws are from time to time promulgated by the different health authorities.

For the effective operation of existing by-laws frequent inspection of dairy premises, cow-byres, etc., and constant vigilance over production and distribution are necessary, but no matter how conscientiously these laws are applied by the persons concerned, the chances for abuses and malpractices by less scrupulous individuals, more particularly in distribution, are never completely eliminated. This is especially the case in centres where milk is still being distributed either by " dipping " or other " bulk " methods. That the less scrupulous can easily enter the fluid milk trade is due largely to the fact that there is no required economic or personal standard for dairymen or their employees in South Africa to-day, although the Dairy Industry Bill, to amend and consolidate the laws governing the dairy industry, did make some provision in this direction under Section 92 of the Bill, as far as milk defined areas were concerned, and although the local Government Ordinance of the Transvaal also refers to this matter generally.

The question may therefore be put seriously : Do these laws and by-laws, affecting the fluid milk trade, protect the public adequately against milk-borne diseases, or is it not possible that some other method of production and distribution could be brought into operation whereby the health of the consumers may better be safeguarded, and through which an even bigger consumption of milk could be induced ?

That such an alternative is possible in regard to distribution is amply borne out by the system of milk distribution inaugurated by the Wellington City Council in New Zealand, which has been functioning with outstanding success, and where, moreover, problems were encountered which led to the deliberate introduction of the municipalisation (in all regards except production) of that progressive city's milk supplies.

In presenting a resumé of this system for consideration by this conference, we have drawn liberally on reports kindly placed at our disposal by the Medical Officer of Health of Wellington.

Prior to 1910, the year when legislative authority, namely " The Wellington City Milk Supply Act, 1910," was first obtained by the Council, to enter upon the control of milk, the milk supply of Wellington was deplorably poor in quality ; some of the causes of this state of affairs being :—

(a) Producers received insufficient inducement in price to ensure the production of wholesome milk.

(b) They were not suitably encouraged by the price paid for winter milk to equalise their production for the calendar year. This resulted in a marked shortage of milk during winter, and an over supply during spring and summer months.

(c) Vendors (i.e. distributors) were not provided with sufficient equipment for proper pasteurisation, cooling and handling of the milk.

The unsatisfactory state of affairs thus engendered resulted in heavy fines being continually inflicted on vendors for selling watered, stale, and butter-fat-deficient milk, while neither the producers nor the consumers had any cause for satisfaction with the then existing conditions.

Between the passing of the Act in 1910, and the year 1917, the milk question was discussed on many occasions by the Council. But in the latter year, on account of the unsatisfactory state of the milk trade, and the high prices obtained on the English market for milk products, the farmers (i.e. the producers) demanded of the Wellington authorities that they take over the control of the milk, or the city's supplies would be cut off.

To cope with this unexpected turn of events, and to meet the difficulties which had arisen, a clearing house was hurriedly established in January 1918, but after only one day's operation it was found that the arrangements were inadequate to handle the business, and the clearing house scheme was abandoned, its failure resulting mainly from the opposition of the distributors.

Following this, a Committee of Investigation was set up, and an expert appointed, to report on the distributing side of the business. His subsequent report revealed a deplorable state of affairs as to the method of handling milk, the condition of dairy premises and plant used, which all went a long way towards the passing of the Wellington City Milk Supply Act in 1919, a consolidating measure to previous laws. The Corporation then arranged to purchase milk which was sold for distribution to the vendors, an arrangement being arrived at whereby vendors adopted a "blocking" system of distribution, i.e., milk was supplied to allocated portions of the city by certain vendors only, the idea being to prevent overlapping and to reduce the costs of distribution of milk.

These vendors grouped themselves into companies, and the Council entered into contracts with these to undertake the distribution of the milk, the retail price of milk being "fixed" by the Council from time to time.

After a careful investigation, the Council assessed the costs of distribution and the collection of accounts at 5d. per gallon, following which

the Council agreed to sell, for a period of three years, milk to the distributors (vendors) at 7d. per gallon *less* than the fixed retail price, thus giving the vendors satisfactory compensation for the loss of their businesses.

The agreement with the distributing companies provided for the retail distribution on the "dipping" system, but in 1921 it was decided by the Council to introduce the bottle system of distribution, and new tenders were called. No tenders were received, however, and accordingly the Council decided to undertake its own distribution service, which was put into operation in 1922. Nearby farmers, 70 in number, were however permitted for various reasons, to continue as producer-distributors. They sell approximately 2,000 gallons per day as compared with the Council's approximate 5,000 gallons daily. It is hoped to incorporate them in the Council's scheme later, on a satisfactory economic basis.

The foregoing is a brief resumé of the events which led to the establishment of Wellington's Municipal Pasteurised Milk Service to cater for its 100,000 inhabitants.

A separate Milk Department has been established, and it has met its capital requirements out of loan monies, about £110,000 having been borrowed up to 1931. Interest on loans and a sinking fund of 1 per cent. are charged against the revenue of the department. At no time has it been found necessary to draw upon the Corporation's general fund, either for capital expenditure or other purposes, nor have profits from the department's operations been transferred to the general funds.

As was perhaps only to be expected, fairly substantial losses were made during the early years of the Council's trading operations, but since 1923, not only have these losses been redeemed, but steady though not abnormally large profits have been made, whilst substantial reserve funds have been created to cover depreciation of buildings, plant, etc. The department is now in a strong financial position, and the following figures applying to the trading year 1930, illustrate the extent and result of the department's financial operations:—

Revenue	£241,815
Net profit	£9,052
Working Expenses	£72,213
Depreciation, Interest and Sinking Fund Charges	£11,761
Written off as Bad Debts (i.e. 1/50th of 1% of revenue)	£48
Purchase of Milk, etc.	£148,741

Overhead expenses have been consistently reduced as the business has expanded. It is of interest to note that the Milk Department pays full rates and current prices for electricity and water supply, thus, except for income and land tax (which are not levied by the Government on

local bodies in New Zealand) the Department has to meet the same charges as private concerns.

It has been conclusively established from the experience gained, and the satisfaction expressed by the interests served in Wellington, that the municipalisation of the milk distribution of large cities, if converted into a trading monopoly, and if properly organised and managed, can confer on both producer and consumer distinct benefits which cannot be derived from any competitive system of trading, and the health of the consumer is adequately safeguarded.

It is significant, in assessing the advantages of such a scheme to note that the New Zealand State Departments of Public Health and Agriculture assisted the Wellington City Council in no small measure to develop their milk distributing service.

What are the advantages and disadvantages of such a scheme, and should a city such as Pretoria consider the adoption of a similar scheme ?

At the outset it might be argued that ratepayers' money is being used in such a scheme to trade against ratepayers (the present distributors). With a scheme of adequate compensation for the distributors, and with the benefits that would accrue to both producers and consumers, we feel that ratepayers can regard such a service as a good investment, similar to the present practice whereby electricity, water supplies, and abattoirs are conducted as trading departments of local authorities.

The municipalisation, for instance, of the Pretoria milk supply would involve 71 producers, 68 producer-distributors and 50 distributors, which may be taken to mean that all the distributing sections or businesses, namely 118 in number, might be amalgamated into one large modern central hygienic plant, adequately capitalized, and controlled by health, economic, and personally satisfactory standards. This would leave 139 producer sections or businesses, (taking it that the producer-distributors would all still continue in business as producers only) sending milk to the Council's plant.

From this it can easily be seen that there would be a great drop in the number of persons handling the milk supply, for it must be appreciated that milk delivered for distribution to such a central plant would not be handled again, except by machinery, until used by the consumer.

Furthermore, another benefit to the town residents would be that the present producer-distributors, whose cow-byres are within residential areas of the city of Pretoria, would be able, economically, to move their business on to suitable milk-production sites, such as the Western Town Lands, since most of these businesses are at present in town, mainly for the convenience of distribution.

Absolutely uniform distribution methods will result from such a scheme, for one thing, the present unsatisfactory delivery boy with

cycle and open baskets delivering milk at all hours of the day, would disappear in favour of proper carts or cars adequately refrigerated and speedy in delivery. Selected European drivers could probably be employed.

Taking this and other aspects of the scheme into consideration, it will be seen that such centralisation of milk distribution would most likely result in an improved avenue of employment for Europeans in the fluid milk trade. Under existing conditions natives are employed practically exclusively for the distribution of milk, and to a large extent in other sections of the fluid milk trade. The department recently estimated that 810 natives were employed in licensed dairy concerns supplying milk to the city of Pretoria.

Representations have been made at various times to consider whether it would not be advisable to exclude natives from the handling of foodstuffs intended for human consumption, and whilst this is probably impracticable in its entirety, the centralised milk distribution scheme would certainly result in fewer natives being employed in the handling of this very important foodstuff.

At the present juncture, when the state is faced with many problems appertaining to farmers, and when schemes of state subsidisation of production have been instituted, it is suggested that the Government might interest itself actively in the scheme outlined, whereby many advantages would accrue to both producer and consumer, and whereby a permanent organisation for providing the farmer with a safe market for his milk would be established, whilst at the same time more work for suitable Europeans would be provided.

In addition to fewer persons handling the milk, such a scheme would reduce the number of undesirable persons in the dairy trade, whether undesirable from a health or moral point of view. All employees of the central concern would be carefully selected Europeans or natives who would be tested and trained for the work.

Economic factors would control the expansion of the distribution plant, whereas at present any person with satisfactory premises, etc., can obtain a distributor's licence in Pretoria regardless of the economic conditions existing in the fluid milk trade at the time of his or her application. There would be a reduced cost of distribution resultant on centralised control, and as is shown hereunder, approximately 7d. per gallon may be saved in distribution costs.

At the present moment milk is being purchased in Pretoria by retailers for about 1/- per gallon, whilst the consumer obtains his milk for 2/- (i.e. 3d. per pint). In other words about 50 per cent., namely 1/- of the present cost of milk to the inhabitants of the larger towns and cities in South Africa is absorbed in distribution costs.

In Wellington (N.Z.) where the milk distribution is undertaken as a social service by the Municipality, and involves huge capital expenditure, the cost of distributing the milk is only 5d. per gallon. This has been made possible by reducing overhead expenditure, eliminating profits, avoiding overlapping in distribution (one of the most costly evils in our present system), and by the utilisation of modern labour-saving automatic plant, e.g. bottling machines, bottle-washing machines, sterilisation plant, etc. In other words, a uniform and better price to producers and consumers, for a better product, would result.

Absolutely pure milk, of a high chemical and bacteriological standard, dirt and disease-free, would be distributed, if pasteurisation is included in such a centralised distribution scheme. This pasteurisation would have to be adequate, that is to say, cleanly produced milk which has been immediately cooled to 38°F at the place of production, should subsequently be heated to 145°F. for 30 minutes and thereafter cooled to 40°F till bottled. Delivery of the milk would be so arranged as to keep the product at as low a temperature as practicable until delivered to the consumer. Thus would there be adequate protection of public health against the germs of milk-borne diseases both of bovine and of human origin. Under the former may be noted the bacilli of bovine tuberculosis, contagious abortion, the streptococci of mastitis, the viruses of foot and mouth disease and cowpox (all transmissible to man), and under the latter category the bacilli of tuberculosis, typhoid fever, diphtheria, haemolytic streptococci, etc.

While it may be claimed that the ideal milk supply is that from healthy animals obtained under clean and disease-free conditions, and consumed immediately, with the least possible handling, we feel, as does the Wellington Milk Manager, "that it is obvious that such supply is, for the present practically unobtainable."

This is not intended to indicate that individual dairies cannot produce clean milk of high chemical and excellent bacteriological standard from tuberculosis-free cattle, and handled by typhoid-tested employees.

The consensus of authoritative opinion to-day is that pasteurisation, when properly carried out, constitutes the most practical and effective measure of eliminating infection from the milk, especially those diseases mentioned, for it is fortunate that the causal factors of milk-borne diseases are completely destroyed by pasteurising the milk at 145°F for half-an-hour.

It may be of interest here to refer to the extent to which tuberculin testing and pasteurisation are carried out in certain of the larger cities in the Dominion of Canada as detailed by R. H. Murray, C.E., in the Canadian Public Health Journal, January, 1934 :—

THE EXTENT OF PASTEURISATION AND TUBERCULIN TESTING IN 24 OF THE LARGEST CITIES OF CANADA.

City.	Province	Population at 1931 census	Year pasteurisation by-law passed	Per cent. of milk pasteurised	No. of Pasteurisation plants	Per cent. of dairy cows T.B. tested
Montreal	Que.	810,925	—	95%	35	100%
Toronto	Ont.	627,582	1914	100%	55	60%
Vancouver	B.C.	245,307	—	89%	20	100%
Winnipeg	Man.	217,587	—	74%	9	51%
Hamilton	Ont.	154,914	1928	100%	20	98%
Quebec	Que	129,103	—	40%	5	100%
Ottawa	Ont.	124,988	—	98%	18	100%
Calgary	Alta.	83,362	—	80%	3	100%
Edmonton	Alta.	78,829	—	75%	5	100%
London	Ont.	71,022	—	81%	16	15%
Windsor	Ont.	62,957	1926	100%	10	5%
Halifax	N.S.	58,939	—	85%	8	80%
Regina	Sask.	53,034	—	96%	7	100%
St. John	N.B.	46,640	—	90%	6	100%
Saskatoon	Sask.	43,025	1923	100%	4	100%
Victoria	B.C.	38,441	—	33%	4	100%
Three Rivers	Que.	35,197	—	57%	3	100%
Kitchener	Cnt.	30,261	—	95%	11	55%
Brantford	Ont.	30,060	—	97%	7	55%
Sherbrooke	Que.	28,888	—	25%	1	100%
Ft. William	Ont.	26,075	—	88%	5	1%
St. Catharines	Ont.	24,703	1929	100%	9	8%
Kingston	Ont.	23,204	—	64%	4	20%
Sydney	N.S.	22,319	—	8%	2	5%
		3,607,362	Average	78%	Tot. 267	Av. 69%

It is striking that but 25 municipalities in Canada, according to available data, require all milk sold to be pasteurised. The by-law in Kirkland Lake was passed following the epidemic of septic sore throat in 1930. Other municipalities might well adopt similar restrictions before, rather than after a similar experience.

MUNICIPALITIES IN CANADA WHICH HAVE PASSED BY-LAWS REQUIRING ALL MILK SOLD TO BE PASTEURISED.

St. Lambert, Que.
Lachine, Que.
Toronto, Ont.
Hamilton, Ont.
Windsor, Ont.
Whitby, Ont.
Sandwich, Ont.
Forest, Ont.
Barrie, Ont.
Iroquois, Ont.

St. Catharines, Ont.
Carleton Place, Ont.
East Windsor, Ont.
North Bay, Ont.
Sudbury, Ont.
Timmins, Ont.
Kapuskasing, Ont.
Walkerville, Ont.
Iroquois Falls, Ont.
Kirkland Lake, Ont.
Leamington, Ont.
Richmond Hill, Ont.
Saskatoon, Sask.
Moosomin, Sask.
Kerrobert, Sask.

On the much discussed merits and demerits of pasteurisation as affecting the nutritional value of milk the following opinions may be cited :—

(1) In a recent address on human nutrition Sir Frederick Gowland-Hopkins, Sc.D., the eminent British biologist and bio-chemist, and president of the Royal Society, published in the British Medical Journal, March 23rd, 1935, the following :—

> "I have myself had reason to review the voluminous literature which bears upon this matter, and somewhat against my preconceptions, I have come to the belief that pasteurisation when properly carried out (an important reservation) affects the nutritional value of milk to a negligible degree. This was recently the conclusion of an expert committee of which I had the honour to be Chairman."

(2) Commenting editorially on the decision of the British Milk Market Board to institute further experimental enquiry into the effects of pasteurisation on the nutritional qualities of milk, "The Dairy" (March 1935, No. 2) observes :—

> "What is postulated as the result of many years of clinical experience by the majority of medical authorities is that, the scientifically controlled pasteurisation of milk, followed immediately by automatic bottling *provides the only safeguard known to science* whereby the dangers of milk-borne disease may be effectively eliminated.
>
> No matter how scrupulously produced, whether from tuberculosis-tested herds or not, raw milk can never be completely immune from the risk of bovine tuberculosis, or *Brucella abortus,* the germ of undulant fever.
>
> Pasteurisation must ultimately be introduced in urban centres at least, *because the public will always be more interested in safety for their children's lives than in any academic discussion as to relative food values.*"

(3) E. V. McCollum, F.A.P.H.A., of the Johns Hopkins University Baltimore, has the following interesting facts to relate in regard to the nutritional aspects of milk pasteurisation (American Journal of Public Health, Volume 24, No. 9) :—

The actual changes in milk caused by pasteurisation are an increase in insoluble calcium of about 6 per cent., a reduction of iodine content by 20 per cent., and considerable destruction of vitamin C. Certain animals have a higher need for calcium than do infants and it may be that raw

milk would be better for them than pasteurised milk, but there is no evidence that this is true for children. There is no convincing evidence that raw milk, even if it were safe, is superior to pasteurised milk in infant feeding. Pasteurised milk is probably better since it is more easily digested.

The Lanarkshire, Scotland, study of 10,000 children receiving three-quarters of a pint each daily—5,000 raw, grade A milk and 5,000 pasteurised milk—with 10,000 as controls, gave clear evidence of the beneficial effect of milk feeding on the rate of growth. There was no difference in the raw and pasteurised milks.

In a letter from Lord Dawson of Penn, to the Editor of the Lancet, December 13, 1930 (A.J.P.H. 21 : 389, 1931) he states that pasteurisation of milk should be universally recognised.

Fortunately, we now have available an excellent study by Leslie C. Frank and others of the U.S. Public Health Service, which should finally silence the critics of pasteurised milk. These investigators studied children fed raw and heated milk, supplementing the diets ordinarily received by American children in 39 cities and in 10 states. The children to the number of 3,700 were from 10 months to 6 years old. The report states :—

> The growth-promoting capacity of heated milk plus the supplementary diet received by the average American child of 10 months to 6 years is not measurably less than the growth promoting capacity of raw milk plus the supplementary diet received by the average American child of 10 months to 6 years.

Since the effect of pasteurisation on the food value of milk is too slight to be apparent in observations on children living under ordinary American conditions, there is no valid argument which can be brought forward in support of the marketing of raw milk for the general population. It is granted that certified milk is as safe as any ordinary foods, but if the optimum amount of milk is to be consumed by the public the price must be made as low as is consistent with the maintenance of high quality.

The only method of accomplishing this objective, which has the full approval of public health officials and bacteriologists, is pasteurisation of the milk supply.

It seems strange indeed that, when we accept so generally the cooking of most of our foods, there should still remain in certain areas a serious objection to the mild heat treatment of milk involved in pasteurisation. The menace of bovine tuberculosis to the health of children is so great that universal pasteurisation should be imperative if only for the prevention of the spread of this disease alone among children.

(4) Extracts from an article by E. W. McHenry, M.A., Ph.D., of the University of Toronto on the Nutritional Value of pasteurised

milk (Canadian Public Health Journal, January, 1934) provide additional opinion in favour of the fact that pasteurisation of milk affects the nutritional value of this food to a negligible degree.

Dr. McHenry states :—

> Milk is a valuable dietary constituent because it supplies high quality protein, calcium and vitamin A. Of these, only one, calcium, is affected by pasteurisation. It is desirable that the depreciation in calcium content be minimised as much as possible by the prevention of local over-heating. Pasteurisation lessens the amount of vitamin C, but raw milk is a poor and variable antiscorbutic and artificially fed infants should always receive a supplement containing vitamin C. Careful observations on large groups of children have shown that growth is as satisfactory with pasteurisation as with raw milk.

In South Africa tuberculosis is assuming alarming proportions, especially in dairy herds supplying milk to urban areas, as was evidenced by recent tests undertaken by the Agricultural Department in and about Durban, when it was found that 39.9 per cent. of animals tested gave positive tuberculin reactions ; moreover, a large proportion of these reactors at post-mortem examination revealed the presence of the disease in infective stages. Contagious abortion and mastitis too are very prevalent amongst dairy cattle. Yet in spite of the fact that these diseases are increasingly endangering the general welfare of our valuable dairy herds, which constitute the most important proportion of a limited number of improved cattle in a country overrun with scrubs, there has not thus far been, for a number of reasons, a national scheme for combating the spread of these diseases, although we are assured that the Agricultural Department has at the present moment under consideration such a national scheme for the eradication of tuberculosis in bovines.

Further, in regard to bovine T.B. infection of humans, R.M. Price, M.B., of the University of Toronto, states in the Canadian Public Health Journal, January, 1934, that :—

> not a single case of bovine tuberculosis infection has been encountered in this generation of children raised on pasteurised milk in Toronto, where pasteurisation is compulsory and has been rigidly enforced since 1915.

As far as one of the milk-borne diseases of human origin is concerned, the Secretary for Public Health, in his last annual report, drew attention to the large number of typhoid carriers existing amongst natives in the Union. Dr. Cluver in his book estimates 2 per cent. of the adult native population of South Africa as typhoid " carriers." When it is considered that actual milking operations are done almost entirely by native milkers, as well as much of the subsequent handling of milk before it reaches the consumer, the chances of contamination by the native typhoid carriers are indeed great, unless precautions, the most effective of which is adequate pasteurisation, are taken. Actually too, numerous outbreaks of typhoid amongst Europeans have been traced to such

sources of infection—one native typhoid carrier alone in Pretoria City having caused sixteen cases of typhoid via the milk and/or cream. A further example of the danger of typhoid spread by milk is the recent typhoid outbreak in Roodepoort-Maraisburg where thirty-three cases were caused by a typhoid carrier contaminating a milk supply.

From the public health point of view, and in terms of the conditions already outlined, a process of rendering milk safe and reliable, as can be achieved by pasteurisation, should be adopted at once although it should be clearly understood here, that failing pasteurisation, constant vigilance is exercised by our Pretoria dairymen and Health Department to ensure that good, healthy milk is sold to the public. In fact, Pretoria can today be proud of its high standard of milk supply, which, with pasteurisation would meet the most rigorous demands.

Furthermore, opponents of pasteurisation should bear in mind that the public so dreads the dangers of milk-borne diseases that boiling of milk before consumption is resorted to, a process which has a deleterious effect on the nutritional qualities of milk, especially the complete and partial destruction of some of the vitamins, the precipitation of albumen and soluble calcium salts, the caramelisation of milk sugar and destruction of the cream line.

Machinery available through a central milk plant would make possible the complete control of the quality of milk obtained from suppliers.

Under existing conditions milk is usually bought in bulk and very little or no regard is given to its quality. This is clearly wrong. It should be purchased according to its quality as determined by its nutritive value, especially fat percentage, bacterial content, presence or absence of flavours and odours, absence of visible dirt, etc. Also, the present standard as laid down by the Food and Drugs Act (No. 13 of 1929) for raw milk must be maintained, as well as the bacteriological standard under the Pretoria By-Laws, before the milk is pasteurised, for pasteurisation can not and must not be regarded as a means of converting " bad " milk into " good " milk.

Clearly, milk not conforming to the standards laid down should not be accepted at a central plant, and this will, needless to add, ensure the requisite standards of production being maintained as the result of the material advantage obtained by the farmers producing the best quality milk. Furthermore, purchasing the milk on its constituents does away with any attempts at adulteration.

By virtue of its high nutritional value, greater consumption of milk is most desirable, but in South Africa no sustained efforts have yet been instituted to inculcate the milk-drinking habit. The risk of disease must, in this country, be considered as being a serious limiting factor. It is also possible to produce, and to make available to the public, other milk

products such as chocolate milk and specially "soured" milks—both products highly beneficial to health, and as yet little consumed in our cities.

A service could also be inaugurated for the benefit of providing mothers with specially prepared milk for infants. Where the state or local bodies desire to provide schools, charitable institutions or necessitous cases with free or cheap milk, a central distributing service would greatly facilitate both control and supply, and would eliminate the present difficulties encountered where such schemes are advanced.

The benefits to producers could again be stressed, as the dairy farmer has been and still is to a greater or lesser extent at the mercy of the milk retail trade. There is thus every reason to believe that the dairy farmer would welcome the establishment of a central milk depôt which would assure him of a more stable market for his commodity, and a more efficient control could be exercised on supplies by introducing quotas, or by better utilisation of surplus milk.

Indeed, in Wellington the farmers forced the Municipality to establish such a central milk plant and distributing service. Supplying milk depôts with milk under present-day systems is not an easy task. The delivery of milk is demanded at very inconvenient hours, which necessitates milking operations being undertaken at all hours of the night and the dairy farmer's job thus becomes a 24-hour a day one. This would be avoided where a central plant is in operation.

Grading of milk would become simplified under such a scheme. An elaborate system of grading of milk for consumption by the public has been developed by the British Milk Marketing Board, and several grades have been laid down. The experience, however, has been that such a system of grading is too cumbersome and difficult to apply. From a practical point of view, it would be better to allow only two grades of milk, namely pasteurised and raw milk, and where producers or producer-distributors can, to the satisfaction of the health authorities, prove that their milk is of a sufficiently high standard to be sold raw, such individuals could be allowed to retail their milk directly to the public.

In other words, those producers who still wished to carry on the present type of business would be forced to conform to a very high standard of production, including the application of all measures to prevent the introduction of disease organisms in their milk supplies, that is, systematic and regular tuberculin testing of their herds, the testing of all employees for typhoid, and the exclusion of all disease conditions in their dairy herds and amongst their employees by frequent and strict veterinary and medical inspection.

Reference should be made again to the important role played by the modernised abattoir to ensure provision of disease free and hygienically

handled meat to the public. It is impossible to think that the public would tolerate a reversion to the old slaughter poles and private slaughter houses of a decade or so ago. When it is recognised that meat is not such an important vehicle of disease as milk is, being usually well cooked before consumption, the establishment of a municipally controlled milk plant is perhaps even more essential than the erection of the present indispensable abattoir.

The argument may be advanced that such a scheme for municipalisation of the distribution of milk in the area of a local authority is but one step towards complete state-control of a milk supply, but in our opinion this will not be the case as improvements and re-arrangements of this type follow on the demand for improvement and for the protection of the public health. This need can be stressed in connection with the distribution section of milk supplies, but for the most part cannot be pressed in regard to the production section. Furthermore, the very effective " clearing-house " system in the meat trade, namely the Abattoirs, has not resulted in state production or distribution of meat.

The presentation of this paper on the municipalisation of milk distribution is not offered as an exhaustive thesis on the subject. It is desired, however, to attract public attention to the possibilities of such a scheme and to invite its discussion by the conference.

Summary.

1. A brief resumé of the Wellington Municipal scheme of milk distribution is submitted, showing its successful practical application.
2. The advantages obtainable, were a similar scheme to be instituted in South African cities, would be :—
   (a) The provision of suitable facilities to purchase milk from producers on a quality basis would maintain and improve the present standards of production, and the central plant would ensure the highest standards in the distribution of the milk, and the prevention of malpractices.
   (b) Reduction in the cost of distribution of milk would ultimately be advantageous to both producers and consumers.
   (c) There would be a reduction (by the use of modernised milk apparatus) in the number of persons actually handling the milk.
   (c) More Europeans would be employed in the fluid milk trade and would be selected and specially tested persons.
   (e) Such a scheme would facilitate the problem of the removal of cow byres from residential areas of towns and cities.
   (f) A simplified and practical grading scheme for milk becomes possible.

(g) At a central plant suitable facilities could easily be provided for disposal of surplus milk, and the production of milk products, so encouraging greater consumption of milk.

(h) A central distribution plant would facilitate the operation of national, provincial or local schemes for free or cheap milk distribution to necessitous individuals.

(i) The expansion of the fluid milk trade in a developing city could be economically controlled and overlapping in the trade would be prevented.

(j) If, in addition, adequate pasteurisation were included in such a central distribution scheme, then practically absolute disease protection would be attainable.

(k) Adequate pasteurisation of milk, in our opinion, affects the nutritional value of milk to a negligible degree, and under present South African conditions is a necessary measure in the fluid milk trade.

THE INTERNATIONAL OFFICE FOR THE PROTECTION OF NATURE.

The Dutch and French Governments have now officially recognized the International Office for the Protection of Nature and have appointed the following delegates to be their representatives to the General Council of the Office:

Delegates for **Netherlands** and **Dutch East Indies:**

Dr. P .G. van Tienhoven, President of the Society for Nature Protection in Netherlands;

Dr. W. A. J. M. van Waterschoot van der Gracht, Chief Engineer of Mines.

Prof. Dr. L. Ph. le Cosquino de Bussy, Director of the Colonial Institute, Amsterdam.

Dr. J. C. Koningsberger, former Minister of Colonies.

Delegates for **France** and **Colonies:**

Mr. M. Bolle, Conservator of Forests, Ministry of Agriculture, Paris.

Prof. Dr. A. Gruvel, General Secretary of the National Committee for the Preservation of Fauna and Flora in the Colonies.

Mr. Raoul de Clermont, President of the Section for Nature Protection of the Société Nationale d'Acclimatation de France.

THE WORLD POULTRY CONGRESS 1936.

We just learn that the date of the 11th World Poultry Congress, to be held in Berlin next year has been altered from 31st July till August 9th, 1936 (see this journal Vol. VI, page 154) to July 24th till August 2nd, 1936.

In other words the Congress will be held a week earlier than anticipated in order to enable Congress visitors to attend the Olympic Games which start on August 1st, 1936.

The alteration in date will not involve the visitors in any financial disadvantage, as to fares etc. which remain as before.

Jl S.A.V.M.A.,
VI. (4) 1935.

Oesophagostomiasis in Sheep.*

By H. O. MÖNNIG, B.V.Sc., D.Phil., Onderstepoort.

Since our meeting of a year ago, much progress has been made with regard to treatment of oesophagostomiasis, and it is this aspect of the problem particularly that I would like to touch upon to-day. We suspected at the time and also expressed the opinion for several years that successful anthelminthic treatment of this disease would be achieved only when a method of administering a suitable remedy directly into the abomasum was evolved. It can now be stated that the information recently obtained fully endorses this view. It appears that the efficacy of the remedy which is now being tested on a large scale is almost entirely proportional to the degree of success obtained in dosing into the abomasum.

With regard to the administration of drugs into the abomasum utilising the oesophageal reflex the work of Dr. Quin and myself has shown that there are a number of controlling factors of which the following are the most important :—

1. The nature and concentration of the stimulant.
2. The age of the sheep.
3. The condition of the sheep.
4. The consistence of the ruminal contents.

It was found that, as one would expect, the oesophageal reflex is more easily stimulated in young than in old sheep. It also stands to reason that the nervous reflexes of sheep in poor condition, which are as a rule very dull, are not as responsive as in normal sheep. Further, it was found that relatively fluid ruminal contents are more favourable for the purpose in view than are relatively dry contents. It is therefore obvious that there are, apart from the stimulant itself, a number of factors which we may call controlling factors which are important in the treatment of verminosis in sheep.

No better stimulant than copper sulphate has been found for the oesophageal reflex, and we may now state that its action is due to the copper-ion and not to the astringency of the solution. Our first experiments were made with one and two per cent. solutions, later three, then five and finally ten per cent. and the success obtained was on the whole proportionate to the strength of the solutions used. If the con-

* Extract of paper read before the 29th Spring General Meeting of the S.A.V.M.A., 12th September, 1935.

trolling factors are favourable a one or two per cent. solution is sufficient to produce the reflex, but if they are unfavourable the stronger solutions produce distinctly better results. With the 10 per cent. solution we can now obtain very nearly 100 per cent. results even in old, poor conditioned animals and a dose of 2.5 c.c. is large enough.

The remedy itself consists of copper arsenate and copper tartrate, both practically insoluble in water but more soluble in acid and alkaline media. Each of these chemicals had produced promising results, but it was found that effective doses came very close to the limit of safety, the former producing arsenical and the latter copper poisoning in toxic doses. Hence a mixture was made and this gave good results but it was also at times erratic in its effects, sometimes killing the sheep and not the parasites. The reason for this was eventually traced to the acid in the abomasum which may cause solution and absorption of the drugs. Slaked lime was therefore added to the mixture in an amount calculated to be in excess of the quantity required to neutralise even a high degree of gastric acidity. Since the drugs are also soluble in alkaline media an alkali had to be used that would not iself produce sufficient alkalinity to promote solution of the drugs. Tests with filtered abomasal fluid of normal sheep have shown that the addition of lime to the mixture affords a marked degree of protection to the sheep. In passing through the small intestine the drugs become partly dissolved and apparently the solution is mainly of a colloidal nature. From a few tests that have been made it seems that the drugs reach the colon about five hours after administration and the majority of the worms are passed 15 to 24 hours after treatment, but some sheep may continue to pass worms for five days.

Starvation is definitely contraindicated because it slows down the passage of material through the alimentary tract, thus favouring absorption and preventing the drugs from rapidly reaching the parasites in the colon. Moreover, starvation tends to empty the abomasum and this is not desirable when a drug is administered directly into this organ. Green food, which passes fairly rapidly through the alimentary tract, appears to have a favourable influence, but sheep may also be treated when on dry pasture. Water should not be withheld and a drink immediately before treatment may affect the consistence of the ruminal contents favourably. It is recommended that no water should be given within 1—2 hours after treatment, for the reason that the remedy appears to be effective against *Haemonchus* and a drink of water immediately after dosing may reduce this effect.

Further studies on the toxicity of the remedy are in progress, but on the whole it appears to be reasonably safe. Under ordinary circumstances treatment at intervals of six weeks is recommended and sheep that are in very poor condition or very small for their age should receive

a smaller dose on the second day. In a test made on six month-old lambs in very poor condition full doses were given at intervals of seven days, three times in succession without any apparent adverse effect on the animals. However, tests on a large scale will have to show whether there may be special circumstances which introduce an element of danger. One such condition may possibly be severe trichostrongylosis which we know is a definite contraindication against arsenical drugs. But since it is mainly the duodenum that is affected in this disease and the bulk of the drugs appears to become dissolved lower down in the small intestine, the danger theoretically appears to be small.

It is desirable to lay some stress on the best times for treatment. *Oesophagostomum columbianum* is a parasite of the summer rainfall area and we know that its infective larvae cannot resist desiccation as well as larvae of *Haemonchus*. They are consequently killed off in dry pastures during the winter and the infested sheep are the source of infection during the next spring and summer. Since prophylaxis should always be our main object even in anthelminthic treatment, the most important time for dosing sheep against this parasite will be in autumn and winter, and all sheep should be treated, not only those that appear to be infested. In a few years' time this parasite will probably disappear as a source of trouble. The wise farmer will, however, continue the autumn and winter treatment.

On the other hand, we know that most deaths due to oesophagostomiasis occur from March or April onwards, because then the feeding becomes poor. The proper time to begin treatment will be in January even though the sheep are still in good condition because then they already are infested and the green pasture is favourable for successful treatment.

CORRIGENDA.

Jl. S.A.V.M.A., VI. p. 82.—Footnote (8). Insert Medical Association in blank space.

Ibid p. 84.—At end of section (f) insert (13).

,, p. 89.—In place of "but the" of first line of explanation Fig. 2, substitute "and."

,, p. 96.—Line 20, insert "out" in place of "uit."

,, p. 98.—Add (32) to footnote commencing "See *The Cape Horse*" etc.

,, p. 105.—Insert the words "Veterinary History" before "in preparation."

,, p. 106.—Add (47) to footnote commencing "In 1825," etc.

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VI. (4) 1935.

Foot and Mouth Disease in Southern Rhodesia.*

By D. A. LAWRENCE, B.V.Sc., Salisbury.

The choice of Foot and Mouth disease as the subject of this paper, was governed by two things. Firstly, the author has had very close contact with it, on and off for the last four years, and secondly, felt that the fortunate people in this part of South Africa might be more interested in hearing at first-hand about a disease which has been threatening their borders for some time, and which for one short period had actually crossed them.

Realising that to introduce a discussion on Foot and Mouth disease at this meeting might mean treading on dangerous ground, the author wishes to point out that although he naturally has Rhodesian interests at heart, he is not concerned with the administrative aspects except indirectly within Southern Rhodesia.

In this paper an attempt has been made to record our experiences of Foot and Mouth Disease, and to indicate the nature of the research work carried out and the results obtained. Many of these results are of considerable scientific interest as, although they have frequently not confirmed the findings recorded in other parts of the world, they have thrown some light on the behaviour and the peculiarities of a well known disease, in an unusual and, it is to be hoped, an unfavourable environment.

After a lapse of about 40 years since its last appearance throughout Southern Africa, Foot and Mouth disease was diagnosed on Nuanetsi Ranch in S. Rhodesia in April 1931. At this time there were few if any in the country who really knew anything about the disease. Four years experience, often bitter, has taught us a lot, but perhaps more than anything else, it has taught us how very little is really known about Foot and Mouth disease.

The origin of this outbreak still remains a mystery. Although many theories have been advanced there is still no feasible suggestion as to the source of the infection. As far as we know all the adjoining territories were then, and had been, free from Foot and Mouth disease for many years. Infection was first detected at least 100 miles from the nearest boundary of an adjoining territory. It would appear, therefore, that the disease was introduced by some indirect means, but as stated previously there is no feasible suggestion on this point, and actually our experience of the spread of infection within the country points

* Paper read before the 29th S.A.V.M.A. meeting.

against indirect transmission. The determination of the origin of infection was of great importance but of still greater importance was the prevention of its spread. It was realised that to slaughter infected and possibly infected herds was out of the question, the numbers of stock known to be involved amounted to something like 60,000 head and as Nuanetsi Ranch alone covers an area of $2\frac{3}{4}$ million acres, it will be appreciated that to gauge accurately the utmost limit of infection, which is essential in the adoption of a slaughter policy, was out of the question.

The manner in which the disease was spreading soon indicated that the greatest danger lay in the movement of infected cattle. Every effort was made to prevent such movement and, wherever practicable, steps were taken to prevent spread by the commonly recognised indirect means.

At this time there was little or no knowledge concerning the behaviour of Foot and Mouth disease under our conditions, and it was not until the disease appeared in the Salisbury area that research work was commenced by Bevan in August 1931.

In his report for 1931 Bevan states :—

" It was at once realised that the disease differed in many respects from that described in text books. Even when material, carefully selected with a view to ensuring its infectivity, was brought to the laboratory with as little delay as possible, and was placed in the mouths, or injected into the veins or under the skin of susceptible cattle, it did not give rise to the disease. This is entirely contrary to the behaviour of the European disease, which is readily transmitted by such means. It was only by injecting infective material into the nostrils of susceptible animals that the disease could be established and transmitted. It was also found that it was only by the closest contact that sick animals were capable of infecting others. Under stable conditions, if their heads were kept a foot or two apart, infection was not transmitted from one to the other. Infected animals drinking at a common water trough did not convey infection to cattle drinking on the other side, and animals made to drink water contaminated by an animal throughout the whole of its infection did not become infected.

Also an animal placed in a stall in which an infected animal had been salivating for the previous three days, and compelled to eat the contaminated food and drink the contaminated water and lie upon the contaminated bedding, did not become infected. On the other hand, cattle in a paddock, feeding with sick cattle from a common trough in such a manner that close head-to-head contact took place, became infected. Thus laboratory observations confirmed and explained the field experience that the disease was of remarkably low infectivity and transmissibility, and apparently did not survive long within

the animal body. Indeed, in all outbreaks the origin of which has been determined, infection appears to have arisen from an infected animal, and it has not been possible to trace infection to any other source. It was found that under laboratory conditions a mild form of infection was set up, characterised by a thermal elevation only, without lesions of the mouth or feet. But blood taken from animals so reacting at the early stages of the thermal reaction was infective when injected into the nostrils of susceptible cattle, and would produce the disease in them either with or without open lesions. In these experiments well-bred animals appeared to suffer more severely than native cattle, an observation in accordance with field experience."

These observations regarding the low infectivity of the virus in Rhodesia, together with the fact that intranasal inoculation of blood virus would readily set up infection, suggested a means of overcoming one of the greatest difficulties associated with the control of the disease in the field, viz.: the great time, even up to 8 months, that it took for the disease to run through all the cattle in an infected area. We regarded the infected animal as the greatest potential spreader of infection and it was therefore this factor which had to be controlled most closely. In such a case, therefore, time was of the utmost importance and the shorter the period that cordons had to operate to prevent movement of infected animals, the greater the chance of success.

As a result of Bevan's research two main methods of ensuring the rapid spread of the disease amongst cattle which would inevitably sooner or later contract it were elaborated, viz.:—

1. Direct intranasal inoculation with specially selected blood virus, and
2. Establishing deliberate close contact between infected and to be infected stock.

In most cases the above two methods were combined. The success of the application of these methods together with the system of cordons and creation of cattle free belts, details of which will be mentioned later, can best be judged from the fact that by November 1932, only eleven months after the first application of the methods in the field, the last case of Foot and Mouth disease in Southern Rhodesia was recorded. It is the considered opinion of our veterinarians, an opinion which I unreservedly endorse, that all infection from this outbreak had by then disappeared entirely.

In view of the necessity of having more varied and detailed research carried out on the virus which was responsible for the outbreak in Rhodesia, and particularly because such research was considered impossible of successful completion in that country, it was decided that the work should be undertaken at the Foot and Mouth disease research laboratory at Pirbright.

At a Conference held in Salisbury in 1931 it was recommended that such research should aim at determining :—

1. The nature of the virus and its infectivity.
2. The origin of infection.
3. The method of transmission.
4. The viability of the virus within and without the animal body.
5. The possibility of conferring immunity.

For this purpose samples of virus were sent to Dr. Andrews who was advised of the peculiarities regarding its extreme mildness and low infectivity which had been observed in Rhodesia.

Bevan in February 1932, proceeded to Pirbright himself and on his arrival he was twitted by Andrews about his mild virus which had not only produced in cattle at Pirbright a most virulent form of the disease but one so easily transmitted that it had, notwithstanding the elaborate precautions there become out of control. How, when and where this exaltation of virulence occurred can certainly not be answered yet and will probably remain a mystery until such time as filterable viruses have yielded up the secrets of their nature to science.

Having in his earliest and perhaps we might say bitter experience of the Rhodesian virus definitely established its identity as a Foot and Mouth disease virus, Andrews next proceeded to type it. It was hoped that typing might have thrown some light on the origin of the Rhodesian outbreak. These hopes were never realised. The first results of typing indicated that our virus was not O virus because it had broken down the immunity of O—immune cattle, whilst Daubney at the same time told us it was O virus. Later, after numerous passages through guinea-pigs, it was recorded by Andrews as a regular member of the O group. By this time, however, in Daubney's hands it had lost all its O characteristics. Results such as these, are perhaps sufficient justification for one to attach little or no importance to the typing of a virus at least in guinea-pigs. In a Medical Research Council Special Report No. 169 referring to certain attempts to type bacteria, the following statement is made :—

> "The failure of Sir F. Andrews may possibly mean that each type is a passing chemical phase, and further study of the delicate chemical interplay between the parasitic bacteria and the invaded patient himself appear to be the next stage of research. That is to say, what bacteria may do in test-tubes in the laboratory is not necessarily the same as they do in the animal body. To many this may seem self-evident, but in some respects the medical profession is only beginning to emerge from the hypnotic influence of the bacteriological magicians of the last fifty years."

If we substitute the word guinea-pigs for test tubes, this paragraph could very well apply to Foot and Mouth disease.

Andrews continued to carry out the recommended research programme on the Rhodesian virus at Pirbright, but space will not allow of the details of these findings being given. Suffice it to say that in most respects the Rhodesian virus, after a series of passages through guinea-pigs, behaved in a manner similar to that of the other viruses, on which such work had been undertaken—a manner very different from that observed in Rhodesia : e.g. at a temperature of 53°F. at Pirbright, Rhodesian virus survived for 33 days on bran, yet in our stables in Salisbury it was found impossible to infect animals feeding and lying upon material on which an infected animal had been salivating and urinating for days.

While this research work was in progress in England a series of experiments was commenced in Salisbury. At the time of Bevan's departure he had stated that our virus, apart from being of low resistance, low virulence and low infectivity even to cattle, was incapable under our conditions of setting up infection in guinea-pigs, pigs and sheep. Andrews, however, found that under his conditions, after a single passage through highly susceptible English cattle, the Rhodesian virus was infective to all these animals. It was felt at the time that this single passage under different climatic conditions was responsible for the change in the virus, and it appeared to be of the utmost importance to supply Andrews with guinea-pig virus established locally by direct inoculation from local cattle.

This work was started as soon as infection had been established in some of the experimental cattle on the station, not an easy undertaking, which was attributed principally to having been supplied with supposedly but not actually viable blood virus collected in the field.

However, after some delay infection was established and maintained, and typical, though mild, cases of Foot and Mouth disease were produced in cattle both by intranasal and intramuscular inoculation. Vesicular fluid taken directly from such cases proved to be infective to guinea-pigs, but the first attempts at maintaining the strain in these animals failed, thus confirming Andrews' observations that our virus, though infective to guinea-pigs, required many passages to become adapted to them. Daubney at this time reported how readily adaptable our virus was to guinea-pigs. The second attempt at Salisbury was more successful, and the strain was kept going in guinea-pigs and guinea-pig virus supplied to Andrews.

There still remained at that time the question of whether pigs and sheep could be infected locally. The pigs presented little difficulty; it was found that they could be infected by intranasal or intramuscular inoculation with blood or vesicle virus and also by feeding on milk from reacting animals.

During the course of experiments on pigs some very interesting peculiarities of Foot and Mouth disease were observed; e.g. animals developed lesions and yet showed no thermal reaction—this feature was observed not only in pigs but also in cattle and we were inclined to attribute some of our earlier negative infection results to the fact that this peculiarity was not then known, as it was customary to diagnose a reaction mainly on a temperature rise, and individuals not showing such a reaction were not subjected to the essential clinical examination of mouthing, etc.

The final experiment on pigs was of particular interest, as it showed how short the incubation period might be, and how lesions might precede, be simultaneous with, succeed, or occur in the absence of a temperature reaction. A cow was inoculated with mixed virus by various routes and three pigs were fed on milk. Within 64 hours of the first rise of temperature of the cow, the pigs were all reacting, one thermally with lesions following the next day, another with lesions followed by a temperature reaction, and the third with lesions but never any thermal reaction. In another case a pig inoculated intramuscularly with the pure vesicular fluid from a foot lesion of a bovine developed a definite thermal reaction after an incubation period of 93 hours, but lesions were not evident until the eighth day.

Another series of experiments was commenced with the object of determining whether local sheep could be infected with our bovine virus. The preliminary experiments were all failures, as only doubtful temperature reactions or none at all were obtained. At this time it was not realised how unreliable temperatures were. Later, however, a definite temperature reaction and even lesions were obtained in sheep inoculated with bovine virus and the disease was successfully passed through sheep and back into cattle.

By November, 1932, Foot and Mouth disease had disappeared from S. Rhodesia, to the best of our belief, absolutely and completely.

On 11th July, 1934, the disease was diagnosed on Nuanetsi Ranch, in a herd of cattle that until a month previously had been under direct veterinary supervision for over a year.

The question of the origin of this outbreak deserves first consideration. As only 19 months had elapsed between the last case of the previous outbreak and the first diagnosed case of this outbreak, it was essential to consider the possibility of the 1934 outbreak being simply a persistence or recrudescence of the 1931-32 infection, the only other possible explanation being a re-introduction of infection from beyond our borders. I may mention at the outset that I am firmly convinced that the latter explanation is the correct one.

In support of this the following arguments may be advanced :—

1. Cattle which had the disease during the first outbreak proved readily susceptible to re-infection in 1934. Authorities on Foot and Mouth disease assure us that immunity to a given strain is almost if not entirely permanent.

   I think all are agreed that this strain specific immunity is solid over a period of at least some years. Our own experience in 1932 showed us that several hundred head of cattle which were infected in 1931 were solidly immune to the earlier inoculation, approximately a year later. A different strain must therefore have been responsible for establishing infection in previously infected animals after only 19 months.

2. Samples of virus were sent to Pirbright for typing and Andrews reported that the 1934 virus was of a different type from the 1931-32 virus. He demonstrated that cattle which were still solidly immune to the earlier strain were susceptible to the latter.

These facts may be regarded by many as indisputable evidence of the second outbreak being the result of fresh introduction into the territory of a new virus, but I am prepared to ignore them entirely, as I am certainly not satisfied that guinea-pig typing is reliable, nor that a given natural strain is not subject to mutation, even by direct passage, as recently emphasised by Daubney. The following passage in a report by Daubney, based on the results of experiments summarises the position very well :—

> "The work carried out in recent years on the guinea-pig types has been of great value in drawing attention to the need that antisera should be polyvalent. It has, moreover, enabled workers to establish the fact that immunity against one type of virus is more durable in cattle than was at first supposed. It has still more recently revealed the existence of bovine strains which antigenically are not covered by the existing three types ; and it has led finally to the conception, not yet generally accepted, of the bovine virus as a labile organism liable to spontaneous phase variations so great that they may make possible the re-infection of cattle through which the virus has quite recently passed. Evidence has been presented to show that repeated passage through the guinea-pig may be responsible for changes in the type of a virus ; it seems probable that the natural passage of a virus through species other than cattle, viz. : sheep, pigs and wild ruminants, may prove to be an important factor in the production of type-variations during the course of an epizootic in cattle."

Ignoring, then, the typing and immunity results first quoted, my reasons for believing that the second outbreak was the result of fresh introduction of the disease are these:—

The disease definitely started on Nuanetsi Ranch in 1934 — all subsequent spreads have been traceable to that source; yet for practical purposes, **all** Nuanetsi cattle proved susceptible, i.e. the disease had not been smouldering there, otherwise, even allowing for strain mutations, a considerable percentage of the animals must have been immune. It also seems inconceivable that if infection persisted since 1931, the disease did not flare up amongst the 50 odd thousand obviously susceptible calves which had been born in the interim.

On these grounds alone, but more especially if one considers the general inspections and the veterinary supervision which were carried out on Mkumi section, it is safe to conclude that the disease did not persist smouldering in cattle.

If it persisted in a bovine carrier, it is extraordinary that the disease never persisted in this way after the 1891 outbreak or even in other areas in this country after the 1931-32 outbreak.

It is also reasonable to assume that a carrier would have infected fresh susceptible calves long before July 1934, or, as the strain is changed, it should also have infected the previously immune stock.

I think it is absolutely safe to conclude that any possible persistence of infection did not occur in cattle. Persistence of infection outside the animal body can be excluded over such a period.

There is one other possibility, and that is the persistence of virus in some animal other than a bovine. The animals to be considered in this connection may be generally classed as game—including antelopes, and in fact any species of wild life. One could theorise *ad infinitum* on this question, but the argument which I advance against the theory of persistence of infection in game is this: during active outbreaks of foot and mouth disease, game play no part worth considering in the spread of the disease—every traceable spread has been due to infected cattle, and in those rare cases where an explanation of the spread is not forthcoming the possibilities of its having occurred through cattle movement cannot be entirely disregarded. Now at such a time, virus concentration in an area is at its greatest, and game have a better chance of picking up infection than at any other time. Yet even in these most favourable circumstances they do not seem to play any part in spreading infection, and I feel that the possibilities of their playing an active part when there is no disease in cattle, are too remote to be worthy of serious consideration.

Apart from the above arguments which have led me to the opinion that our 1934 outbreak was the result of fresh introduction of infection,

there is still another, what one might almost regard as a negative reasoning and that is, why has the disease not re-appeared in any other old infected area, or even in some clean area to which animals after recovery from the 1931 infection were moved.

In view of the very successful results of the control measures adopted in the previous outbreak which led to the complete disappearance of the disease in a matter of twenty months and also because once again slaughter was out of the question on account of the movements which had taken place within and even from Nuanetsi Ranch, it was decided to adopt them again. Briefly, the method is to diagnose the disease in an area as early as possible—this can only be achieved by a system of regular and careful inspection. I may mention here that in certain cases when the disease takes on a particularly mild form this inspection must be a really thorough one, so much so that for months now inspectors have not only been inspecting herds, but actually catching and examining a percentage in each herd. On infection being detected all infected cattle and all cattle which may possibly have been in contact with infection, are concentrated, being herded by day and kraaled by night. Natural barriers, fences and cordons formed by special native police are employed to ensure that these animals are confined within certain limits. Around this "infected area" which has taken in a considerable tract of known non-infected country, a cattle free belt of from 5 to 20 miles is established and maintained by the same means as in the infected area.

The cattle are then inoculated intranasally with blood virus, to which vesicle virus has also been added to ensure its infectivity, the object being to get every one of them infected and over the disease and thus past the dangerous stage as soon as possible. That the method has again proved successful can best be judged by the fact that no active infection, in spite of most careful inspection, has been detected in Southern Rhodesia since June last.

We, in Southern Rhodesia, fully appreciate that this method of control is not an ideal one, but it does appear to be the best practicable method yet devised for controlling Foot and Mouth disease in, and I hope and believe eradicating it from, Southern Rhodesia.

During the course of the 1934-35 outbreak, when not actively engaged in preparing and organising the preparation of virus for inoculation purposes, I was able to undertake a certain amount of research work. Most of the work undertaken should really be considered as laboratory research but when it is considered that by far the greater part of it was done 325 miles from a laboratory and even over 100 miles from the nearest village and rail head, that the conditions were not exactly ideal will be appreciated. In spite of these difficulties, I feel

justified in drawing the following conclusions regarding the viability of this virus under our conditions :—

1. The virus is readily infective to guinea-pigs.
2. If a beast is slaughtered at the height of infection and the various tissues shade dried, virus is not recoverable from the skin, nasal, buccal or lingual mucosae after 3 days—it is recoverable from the vesicular epithelium and the sensitive lamina after 3 days but not after 8 days.
3. Virus is not demonstrable in the vesicular epithelium or the sensitive lamina of a recovered beast 11 days after the height of reaction.
4. Virus will not survive drying for 4 days on grass or Mopani leaves.
5. Virus will not survive drying for 7 days on Green Mulala.
6. Virus may survive for 4 days but not for 7 days on riem.
7. Virus may survive drying for 14 days but not for 21 days on dry Mulala.

In addition to these intentional and limited experiments which indicated the very short period of viability of virus both within and without the animal body, I had the good fortune to be associated with an accidental experiment which confirmed my results and also our field experience. In August 1934, over 2,000 head of cattle were concentrated and inoculated at Makados Camp in the West Nicolson area. Good reactions developed. One month after the date of inoculation 50 head of mixed cattle strayed in from the clean area and were to be destroyed. I was able to arrange that these animals should be clearly marked and particularly closely guared. They were herded and kraaled with the 2,000 recovering or recovered animals for over 2 months, during which time they were inspected daily. Not a single animal developed infection.

Thus the accidental straying of these 50 provided a large scale experiment which indicated that in a matter of one month from the date of inoculation there was a complete disappearance of infective material from over 2,000 animals and also from the formerly grossly infected kraals and pastures.

The Control and Eradication of Ticks in South Africa with particular reference to the Province of Natal.

By A. M. DIESEL, M.R.C.V.S., Pietermaritzburg.

This subject can be divided into a number of sub-headings which may be taken in the following order :—

The History of Tick Infestation and Tick Destruction.

It is difficult to determine when the first ticks arrived in this country, who brought them here, or to what extent the first settlers were inconvenienced by them. Sufficient be it to mention that at the time when redwater was first recognised as a formidable disease of cattle in South Africa, ticks were apparently very well established in most parts of what now constitutes the Union.

Redwater was apparently first observed in Natal in 1870. Certain extracts of a Natal Government Notice No. 51 of 1895, which constitute portion of a reply by Mr. Wiltshire, C.V.S., through Mr. Henry Binns, Esqr., M.L.A., Natal, to the Chief Inspector of Stock, Queensland, in connection with the latter's request to be given some information in regard to South African Redwater, read as follows :—

> " A theory has been started, and somewhat widely spread, that this disease was somehow caused by ticks. I believe it originated in America, and was adopted here, but the grounds for such a belief do not appear to me to have any foundation. It is beyond all question that the tick existed in Natal many years before Redwater was introduced or recognised in the country. In the Cape Colony, I understand, ticks prevail in places where Redwater has not yet extended, and it is well-known that ticks prevailed there ten or twelve years ago when the disease reached there through Kaffraria.
>
> " There are two or three ticks here, but the one commonly known as affecting cattle and horses and often spoken of as the Blue-tick, or *Ixodes plumbus*, is really *Amblioma Hebraum*, as I am informed by a gentleman who studies such matters, and who tells me that *Ixodes Bovis* is not here.
>
> " I find difficulty in accepting the origin of the disease through the bite of a young tick, in the face of the fact that the same kinds of ticks existed in the country long—doubtless ages—before the appearance of the disease."

It was not until the appearance of East Coast Fever in this country, that real interest was taken in the combating of ticks, and in those old days it was more a matter of tick dodgery than tick destruction.

Compulsory dipping of cattle in Declared East Coast Fever areas has been taking place in Natal since the institution of Act 32 of 1903 (21.9.03). This act was of course, brought in to prevent the spread of Rhodesian redwater. It gave the minister powers to order dipping of cattle and such other animals as he was willing to specify for the purpose of destroying ticks.

In January, 1902, the first cattle dipping tank was built on Sir Joseph Bayne's Nelsrust Estate. Prior to this there existed what was known as the Douglas method of spraying cattle. This was a method of spraying with soft soap and paraffin. It was seemingly never very popular or very extensively practised in Natal. East Coast Fever first entered Natal (Buluwane Valley of the Nongoma District) at about the time when Act 22 of 1903 was passed (March 1904).

In the Cape there was firstly the Cattle Cleansing Act 31 of 1908, and its amending Acts 43 of 1909 and 11 of 1910. In the Transvaal there was the original Diseases of Stock Ordinance of 1902, followed by Ordinance 38 of 1904 and 10 of 1908. The first case of East Coast Fever in the Transvaal occurred in May, 1902 at Komatipoort, but in those days the Transvaal authorities preferred spraying to dipping. Spray pumps were distributed and spraying material sold at cost price. At Union these Acts with the exception of the Cape Cattle Cleansing Acts were consolidated into the present Diseases of Stock Act 14 of 1911.

Our Country must be regarded as very nearly totally tick infested. In Australia, the Argentine and Uruguay for example, there are distinct zones some infested and others not. Brazil is infested throughout.

In Texas, which is held up as the example to show that tick eradication is possible, success seems to have been attained only in respect of the one host transmitter of Texas Fever.

II.—The Necessity for Tick Eradication and Control.

In South Africa and in other tick infested countries tick control and eradication is desirable for the following reasons :—

(i) Because of the part played by them in the transmission of animal diseases and disorders.

(ii) Because of tick worry, economic loss and cruelty to animals.

(iii) Because there **are** countries which have protective legislation to prevent the introduction of ticks with imported animals.

Most of our South African ticks can be said to belong to the disease transmitting group. Thus by eradication and control of ticks, because of reason No. 1, reason Nos. 2 and 3 are automatically provided for. Differentiation in respect of the various ticks and the diseases they are capable of transmitting, is well known.

By far the most important disease, in South Africa, transmitted by ticks, is East Coast Fever and our existing regulations governing tick control are based on this disease. Only certain proclaimed East Coast Fever areas (Natal and Zululand among them) are subject to these regulations and in respect of the remainder of our country, tick destruction and control is still to a large extent left to the animal owner himself.

III.—Known Methods of Tick Control and Eradication.

In South Africa we have not yet made any serious endeavour to eradicate ticks but we have taken definite action to control ticks, e.g.:—

(a) *In East Coast Fever Areas* dipping and hand-dressing of cattle is compulsory. It is an offence under the regulations for a bovine to be found on the road in a tick infested state. Movements of hay and hides, etc., are controlled.

(b) *In Areas not Infected with East Coast Fever.*

(i) It is an offence under the regulations to introduce bovines into an East Coast Fever area in a tick infested condition. Wide circulation has been given to departmental literature, in which cause, prevention and treatment of tick borne diseases are discussed. Animals intended for export have to be free from ticks.

(ii) In the Cape Province we have the requirements of the Cattle Cleansing Act which is referred to in another article.

The known methods of tick eradication and control may be set out under three sub-headings, viz.:—

(1) Saturation of the host with a tick destroying agent.

(2) Destruction of ticks by treating pastures.

(3) Destruction of ticks by starvation and rotation of grazing.

(1) Saturation of tick host with tick destroying agents.

This is almost invariably accomplished in South Africa by dipping and hand-dressing. Spraying is seldom resorted to. In order to control and eradicate ticks by dipping, consideration must be given to the life history of the host.

(a) *Destruction of "One host ticks."*

Of the one host ticks which concern us, *Boophilus decoloratus*, the transmitter of redwater and gallsickness and spirillosis, is the most common; in fact, it can be said that even though this tick is one of the easiest to deal with by dipping, it is still one of the most widely distributed of South African ticks.

To combat successfully this tick, its hosts must be dipped once every three weeks. As its immature stages can be found in the ears of animals, hand-dressing also becomes necessary. *Margaropus* and the

Spinose Ear tick can be combated in the same way, though with the latter it becomes necessary to pay attention to infested kraals and premises and to keep animals away therefrom. As is known only the immature forms of this tick are found in the ears and hand-dressing of the host is usually sufficient.

(b) *Destruction of Two and Three Host Ticks.*

Among the two and three host ticks are the *Rhipicephalidae, Hyalomma aegypticum, Amblyomma hebraeum* and *variegatum* and the dog-tick *Haemaphysalis leachi.* It is unnecessary, of course, to refer to the cosmopolitan tick *Rhipicephalus evertsi* beyond stating that in my opinion this tick plays a much bigger part in the transmission of redwater and East Coast Fever than it is given credit for.

To combat successfully the *Rhipicephalidae* and *Haemaphysalis leachi,* it becomes necessary to subject their hosts to dipping and hand-dressing every three or four days. With *Amblyomma,* dipping at weekly intervals will suffice, though, because the latter are difficult to kill, hand-dressing of such affected parts as the perineum, udder and scrotum must not be forgotten. The same applies to *Hyalomma aegypticum.*

There is one other tick that has not yet been mentioned and that is *Ixodes pilosus,* the sheep paralysis or Russet tick. This tick is fairly common in certain parts of the Natal bush. Farmers complain that it is a difficult tick to deal with by seven day dipping when their cattle run in the bush.

(2) Attention to Pastures and Habitat of Tick Hosts.

The only method hitherto considered in this country is veld burning. This is a very imperfect method of tick destruction as more often than not only such ticks as may be on the vegetation itself are destroyed. The Natal farmer as a rule has this possible method of tick destruction in his mind when he burns his veld.

(3) Destruction of Ticks by Starvation and Rotation of Grazing Areas.

The success of this method depends on being able to obtain non-tick infested veld. It necessitates not only keeping the particular area free from all hosts of the ticks for the adequate period, but also keeping a zone of at least 30 yards free from these hosts.

In dealing with the one host ticks it is necessary to keep such areas free from all hosts for at least 8 months; with the *Rhipicephalidae* and *Haemaphysalis leachi* this period must be extended to 15 months and to two years with *Hyalomma aegypticum* and *Amblyomma hebraeum.*

This method may be combined with one of cleansing stock from ticks by rotating their pastures at periods necessary to allow all ticks to leave their hosts in the natural way, but not long enough to allow fresh ticks

climbing on. The pastures so vacated are then left for the necessary period required to cause the death of the ticks by starvation.

IV.—Applicability of the Known Methods to South African Conditions.

It is my opinion that the farming methods of this country, its uncertain rainfall in many parts, and the fact that game birds, rodents and species of wild carnivora can become the hosts of so many of our ticks, will make total eradication impracticable in by far the greater part of South Africa to-day and for many years to come.

Only a very brief consideration of the known methods of tick destruction brings one to the conclusion that dipping and hand-dressing of the domestic animals is the most favourable and practical way to *control* tick life in order to ensure the minimum of mortality from tick borne diseases and to prevent economic loss.

It may be possible in some parts to combine the starvation method with dipping, but generally speaking this is impracticable in South Africa. For many reasons even the satisfactory control of ticks by dipping has its practical limitations.

This phase of the subject can be further enlarged upon and East Coast Fever Areas should be considered first.

In the early days the inspectors appointed to supervise tick destruction had very large areas to control and dipping was left very much to the cattle owners themselves. To-day we have a staff of just on 300 European inspectors in Natal and Zululand. This allows of supervision over dipping operations at intervals of from 5 days in infected areas to once in 6 weeks to 2 months in clean areas, with an average throughout the province of once every 14 days to three weeks.

Even this control is insufficient now-a-days. The numbers of ticks naturally increase proportionately with the numbers of hosts, and when it is considered that in 1902 there were approximately 520,000 head of cattle in Natal and Zululand as against about three million to-day, it is readily appreciated that even tick control, let alone eradication, must become more and more intensive every day, if success is to be achieved. In 1913 there were 3,250 cattle dipping tanks in Natal and Zululand. To-day there are nearly 6,900.

The whole of Natal is gazetted for seven-day dipping and hand-dressing but this of course is usually extended to every 14 days during the winter months, because of the poor state of the cattle.

Other factors which interfere with proper control are :—

(1) Poor condition of the stock in times of insufficient grazing.

(2) Indifferent cattle owners.

(3) Contention by certain cattle owners that too frequent dipping produces loss of work with oxen and loss of milk in cows.

(4) Reluctance on the part of cattle owners to dip calves.

(5) Financial embarrassment of certain cattle owners from time to time and their consequent inability to keep their tank fluid up to proper strength.

(6) Difficulty in obtaining adequately constructed cattle tanks.

(7) Indifference of the average South African native on whom the duty of dipping cattle only too frequently devolves.

Enough has been said to indicate that even in East Coast Fever areas where the maximum opportunity to control and eradicate ticks, exists, it is a most difficult matter to reach finality. There is no doubt, however, that in East Coast Fever areas considerable progress has been made. A comparison of the incidence of tick-borne diseases in recent years with what it was even ten years ago, indicates this very clearly.

In the Areas not infected with East Coast Fever, the position is nothing like so satisfactory. There hundreds of ticks can be found on cattle, in spite of the fact that they live as a rule at much higher altitudes, where tick life is usually less active.

Before drawing my conclusions, it becomes necessary to consider one other phase of this subject, viz. :—

V.—The Undesirability of Tick Eradication.

It would seem from what is known of the part played by ticks in the production of natural immunity to tick-born diseases, that total eradication of ticks is not desirable.

It should be remembered, however, that :—

(1) Regular dipping, together with systematic inoculation with redwater and gallsickness vaccine, will definitely prevent the tick-borne diseases of cattle from becoming an economic factor of much concern to the cattle owner. East Coast Fever may at times here seem to be the exception which is liable to prove the rule, but when we refer to the Annual Report of the Kenya Department of Agriculture for last year, and read from 60—80 per cent. of calves die in the endemic non-dipping East Coast Fever areas of Central and South Kavirondo, and that East Coast Fever and redwater claim a very high mortality in these non-dipping areas, I think that we can accept Sir A. Theiler's conclusion that the danger of reducing immunity by tick eradication is more than balanced by the benefits that would accrue.

(2) Secondly, we have good curative treatments now-a-days for many tick-borne diseases.

(3) Thirdly, by dipping cattle regularly and other animals occasion-

ally, mortality in all animals generally is reduced to a minimum when it becomes an economic proposition to keep such animals on such pastures In this regard heartwater is particularly concerned.

(4) Lastly, the possibility exists of a 6 gallon cow having gained her natural immunity to tick-borne diseases in the usual way but becoming almost a dead loss on account of destruction of her udder by ticks.

VI.—Conclusions.

(i) Total eradication of ticks is very desirable in South Africa, but is not practicable.

(ii) Tick control is practicable and should be persisted with until the maximum means of control has been reached. To obtain this, sufficient and efficient staff should be placed in East Coast Fever areas, to allow of regular supervision over counting and inspection of all cattle on clean farms once every 14 days and on all East Coast Fever and contact farms once every 5 to 7 days. A minister's order should readily and easily be obtainable for the dipping and cleansing of animals other than cattle as necessity for this arises.

(iii) Arsenical dips should be made available to stock owners at cost price, as also all material necessary to build dipping tanks and to keep them in proper repair.

In Areas not Infected with East Coast Fever, legislation should be introduced making it compulsory for all cattle to be dipped and hand-dressed once every three weeks from the months of October to May inclusive. Part-time Inspectors should be appointed and their duty should be to inspect cattle regularly and certain other domestic animals from time to time. It should be an offence against the regulations for an adult one host tick to be found on cattle in these areas during the months specified. Furthermore, it should be an offence for a bovine to be found on the road with engorged adult ticks of any kind whatever.

Over and above this, inspections of other animals should from time to time be conducted by the inspectors and if necessary minister's orders obtained for the cleansing of such other animals as are found grossly tick infested. This should apply to East Coast Fever Areas also.

Every facility should likewise be given in these areas to enable stock owners to acquire dipping tanks and dipping materials at cost price.

Finally, I think research work should continue to endeavour to find a tick-destroying preparation less toxic and dangerous to handle than the present arsenical preparations.

A short note on the control and eradication of ticks in the Cape Province.

By J. NICOL, M.R.C.V.S., East London.

As the reasons and necessity for the eradication of ticks have been dealt with, this article will be confined to a short history and review of the methods adopted in the Cape Province to combat the tick menace during the last twenty-five years.

History.

About 1904 the farmers in the Eastern Province became alarmed at the large increase in ticks and the consequent spread of diseases, especially redwater and heartwater, and an investigation took place by various officials, including Lounsbury and officials of the Veterinary Department. The Grahamstown farmers were particularly active in this matter and quite a few cattle tanks were built in that area about 1905. It was realised that the bont tick was the carrier of heartwater, for a tank was built by the government at Cottesbrook, Kroomie, then known to be a very bad heartwater farm, and dipping experiments were carried out there under R. W. Dixon, Government Veterinary Officer.

It was some time, however, before the Cape Government could be persuaded to approve of any legislation to control the tick menace but eventually through the late G. Blaine, Act 31 of 1908, generally known as the Cleasing Act, was put through Parliament and became law that year.

This act was a permissive act and could only be applied to those districts where the Divisional Council asked for it and though far from perfect was a genuine attempt on the part of the Cape Government to deal with tick infested cattle, and is still in force in many districts in the Cape to-day. Under this act tick infested cattle were not allowed on a main road, divisional or municipal road, public outspan or commonage, unless the owner could produce a certificate that the cattle had been cleansed within the previous 14 days. Any field cornet, justice of the peace, police officer or sheep inspector could stop the tick infested cattle and demand a certificate, and if this could not be produced, or if the owner could not prove to the court that the cattle had been cleansed during the last 14 days then he would be guilty of a contravention of the act and liable to a fine of £10. There are other sections in the act such as cleansing cattle in the pound etc., but they do not concern us here. Suffice to say that the above act in itself was far from complete, in fact anyone with a certificate that the cattle were cleansed within 14 days could not be prosecuted. That was the weakness. It is not surprising therefore, that we find amending acts in 1909 and 1910.

Act 43 of 1909 conferred the power on local authorities to construct dipping tanks, and also authorised them to engage a cattle inspector and pay him out of their local funds, but the Government had to contribute not more than half his salary, the maximum contribution to be £50. Further, this act authorised the inspector, field cornet, justice of the peace, sheep inspector or police officer, to dip any cattle that were found tick infested despite the owner having a certificate that the cattle had been cleansed. Cattle that were tick infested could be taken along the main road for at least 10 miles, provided the owner was driving them to a dipping tank, and escape prosecution.

In this act one can guess that the fear of East Coast Fever was before Parliament, for there is a section stating that no person could pull a tick off an animal without the written permission of the Resident Magistrate of the district except to destroy it, and if any person knowingly removed or carried or conveyed a tick from one place to another he would be liable to a fine of £150 or 6 months hard labour or both, or imprisonment without the option of a fine.

Act No. 11 of 1910 was also an amending act wherein the driver of the cattle as well as the owner could be charged with having tick infested cattle on a main road, but the principal difference was in the schedule to the act giving the form of certificate that should be used by tank owners. There the certificate had to state that the cattle were dipped or sprayed with an effective tick destroying solution.

In the above acts "*tick infested cattle*" are defined stating that it shall mean any animal visibly infected with ticks and which has not been cleansed within the number of days required by the act.

As the above acts were all permissive and only dealt with tick infested cattle in public places, they did not help much to control ticks, for a farmer could breed them as much as he liked on his farm provided the cattle put on the roads were clean.

Prior to 1910 arsenite of soda which contained only 65 per cent. arsenious oxide at a strength of 5-lbs. to the 100 gallons was used for dipping or spraying, and needless to state there was a lot of scalding not only due to the strength of the dip, but also on account of the impurities in the arsenite of soda.

Compulsory Dipping.

It was not until January 1912, when East Coast Fever broke out in East London and Kingwilliamstown districts, and when compulsory dipping was properly enforced and owners were forced to build dipping tanks that steps were taken to control the ticks in the Cape Province. Compulsory dipping was enforced in most of the districts on the border, but it was actually only in the district where East Coast Fever was present that any headway was made, for although compulsory dipping was

gazetted for districts like Peddie, Albany, Fort Beaufort, Victoria East, Bedford, Cathcart, Queenstown, Stutterheim and Lady Grey, no inspectors were appointed to see that the dipping was carried out, so that the dipping was left to the farmers themselves. In East London, Kingwilliamstown and Komgha, inspectors were appointed and dipping and hand-dressing were strictly enforced. This made these districts safe for sheep and it was surprising how land values increased, particularly in the Komgha and East London districts.

Increase of Land Values due to Tick Eradication.

Prior to 1910, about 1906, Messrs. Cooper and Nephews purchased Gonubie Farm, East London district, for £5,000, this farm being considered most unhealthy for stock and the worst tick infested farm on the coast. They cleaned up this farm with 7-day dipping and eventually they were running imported cattle on that farm without having them inoculated and during the last two years they had the farm they never had a case of gallsickness on the farm. They sold the farm in 1920 for £13,000, and a month later the farm again changed hands at £16,000.

This continued compulsory dipping completely eradicated heartwater from the East London and Komgha districts, and farms that used to fetch 10s. per acre went up as high as £3 and over per acre. In Komgha district a large number of farmers in the Cathcart and Queenstown districts own farms on the coast to which they send their ewes in lamb about May every year. They allow them to lamb at the coast and when the lambs are about three months old they take them up country again. I may add that approximately 120,000 sheep trek every year into these two districts, especially Komgha.

Necessity for Control by Inspectors.

This state of affairs lasted until 1924, when all East Coast Fever restrictions were removed from the border districts and the inspectors were done away with and the dipping was left to the farmer himself. Early in 1926 saw several outbreaks of heartwater in Komgha and East London districts and the sheep farmers became alarmed, for only the progressive farmers were dipping efficiently. This could only have one end, and it did not surprise anybody when some bad outbreaks of East Coast Fever were discovered in Komgha district in September 1926. Dipping and hand-dressing was and is still rigidly enforced so that Komgha is quite safe for sheep again, but if the inspectors are taken away it is questionable how long this state of affairs would last. This district has been particularly quoted in order to show how useless it is to try to control ticks without inspectors.

Economic Benefits that could be derived by the Control of Ticks.

In a previous chapter it was shown how the price of land advanced as soon as farms became safe for sheep as far as heartwater is con-

cerned. Sheep run on the coast right from Bizana district, Transkei, to the end of Komgha, and heartwater in these areas is unknown, in fact in the Transkei I have never seen hearwater and have only seen a few bont ticks on cattle in the Bashee Valley and then only at one tank. We have a stretch of country from East London to Mossel Bay which if thoroughly dipped out would carry any amount of small stock and once it could do that, the price of land would rise proportionately.

Further, the losses that a farmer has every year from redwater and gallsickness and the relatively small proportion of calves reared would be done away with, and the farmer would have every chance to make progress.

I notice in the Farmers' Weekly that its veterinary adviser sometimes advocates the non dipping of calves so that they can grow up more or less immune to redwater and gallsickness. In East Griqualand the farmers there have been doing something similar, yet in that area we get more gallsickness smears than in the whole of my area combined. Their losses are heavy and it would be more profitable for them to dip. Again, some farmers are afraid of their milk record and complain bitterly about the loss of milk due to dipping. I have never yet met any two farmers who agree on the actual drop in the yield of milk due to dipping. Some farmers say 2% others 10%, whilst one dairy farmer in East London states that he never loses more than 1 per cent., and states that considering the loss of milk up against the loss he sustains through sickness caused by ticks, loss of a quarter, etc., he finds that it is much more profitable to dip his cattle.

Desirability of the Eradication of Ticks.

Mr. Diesel has gone into the desirability of the eradication of ticks, and I heartily agree with all his suggestions, especially that of the necessity of being able to issue a cleansing order. As every field veterinary officer knows, farmers, when the dipping is not under our control become only blue tick dippers, i.e., they dip just often enough to keep blue ticks from engorging on their animals, well knowing that the presence of blue ticks would mean prosecution and *prima facie* evidence that the cattle have not been dipped in an effective tick destroying fluid for at least 21 days.

I need not go into the question of the tick menace any further, except to state that despite inspectors being appointed in various districts under cleansing acts, no progress has been made in these districts, and it is only in the districts that have been or are infected with East Coast Fever that any progress has been made or ever will be made until we get a new dipping act to deal with districts not infested with East Coast Fever.

MATTERS OF VETERINARY INTEREST, 1795-1881.

(Concluded).

By H. H. CURSON, Onderstepoort.

CHAPTER V.

Miscellaneous.

(a) Further Notes on the Horses of the Cavalry Regiments. (b) Veterinary Literature. (c) Notes on Pioneer Members of the Profession who were not in the Army Veterinary Service. (d) Three Colonial Campaigns. (e) References concerning the History of the Veterinary Profession. (f) General Conclusion. (g) References

(a) Further Notes on the Horses of the Cavalry Regiments.

1796-1803.

It will be seen from Table I that the regiments arrived, dismounted and that horses were purchased at the Cape. The 28th and 8th Light Dragoons were mounted at the close of 1796, but Thomas Burrowes, the first Veterinary Surgeon, did not arrive until 1799. The chief difficulty appears to have been the supply of fodder. It is not clear if horses were taken to India in 1798-99 and 1802-03 respectively.

1805-1806.

The detachment of 200 men of the 20th Light Dragoons which accompanied General Baird's Expeditionary Force to the Cape was apparently entirely dismounted on leaving Great Britain, although reference (Theal, 1897-1899, V p. 243) is made to horses being on board the transport *Albion*. Lieut.-Col. R. Wilson of the 20th Light Dragoons has left a document (reproduced by Theal, pp. 320-337), describing not only his purchase of remounts at San Salvador (from 10th—26th November, 1805), but also Major-General Beresford's march overland from Saldanha Bay to Cape Town. Between 60 and 70 horses (including a few mules) were purchased, no mention being made at all of Veterinary Surgeon W. Hargrave who probably joined the unit at Capetown after the occupation. Wilson states that 46 horses were placed in the middle deck ("and not in the hold as customary") of the *Varunna* or *Verona*, and the remainder distributed among the other ships.

The horses on the *Verona* suffered much "from damp and heat between decks, for no wind sails had been put on board." This omission as well as the provision of slats for the slippery deck was attended

Government Notice No. 32, 1874.

HIS Excellency the Lieutenant-Governor directs the publication for general information of the following Report by the Commission appointed to enquire into the causes of the disease in cattle called in Natal "Red Water."

By His Excellency's command,

D. ERSKINE,
Colonial Secretary.

Colonial Office, Natal, January 31, 1874.

REPORT
OF THE
COMMISSION ON RED WATER.

Surveyor-General's Office,
23rd January, 1874.

MAY IT PLEASE YOUR EXCELLENCY,—

After a careful perusal of the evidence on the above disease, furnished by oral examination of witnesses, the answers obtained to the queries in the schedules which were sent to holders of stock, by the perusal of different communications which have appeared in the public prints, as well as by the results of our own investigations, we beg to submit the following Report,

And are,

Your Excellency's humble servants,

P. C. SUTHERLAND, M.D., L.R.C.S. Ed.
G. LINDSAY BONNAR, M.D., L.R.C.S. Ed.
JAMES W. WINTER, M.R.C.V.S.
J. D. NICHOLSON, J.P.

I.—ANATOMICAL APPEARANCES.

In order to form an intelligent idea regarding the nature, causes, and treatment of Red Water, it is necessary in the first place to summarise the evidence collected in our investigations; and as the pathology of the disease must be the ground work of our Report, we shall first notice the appearances presented in fatal cases, as summarised from the evidence collected in the answers furnished to the list of queries sent out.

a. ABDOMEN.

1. *Stomach.*

In the evidence taken by us, attention has been mainly directed to the abdominal organs, as the seat of disease. No morbid appearances are recorded in connection with the first and second stomachs; but in our investigations we have noticed intense inflammation affecting both the *rumen* or paunch, and the reticulum or honey-comb.

The condition of the third stomach or manyplus is noticed by all; but the particulars given are for the most part confined to the contents of the cavity, and not so often descriptive of the condition of the organ itself. Its increased bulk and hard and impacted state are noticed, and its contents described as hard, dry, lumpy, baked, &c. The mucous lining of this viscus is in a state of intense inflammation. On denuding it of the blackish grey epithelium which is seen to cover its entire surface, and which, being detached by the inflammatory process readily peels off and adheres to the ridges of impacted grass between the folds of the manyplus, the mucous membrane is seen to be highly injected throughout.

Fig. 17.
THE FIRST PAGE OF THE NATAL 1874 REDWATER REPORT.
This led to the appointment of the first state veterinary surgeon in South Africa.

to subsequently. On December 5th the fleet (of approximately 60 ships) "laid to, in order to collect the horses scattered in the transports and put them all on board the *Maria* . . . Night came on and we could not complete the transfer," but this was done later. Altogether five horses had died, some being "dreadfully mangled during the gale, by not being properly secured on the decks." On December 10th Lieut.-Col. Wilson was called to the *Verona* as the horses were not well. On December 14th he reports "our horses suffer much," and "hailed the Commodore to request better water, as it has turned sour by being placed in wine and beer casks not properly cleansed." On December 15th "two horses raised from the agonies of death by oatmeal, gin, and hot water . . . As all the horses on the windward side have been without exception well, and as the leeside has never wanted air, but for the first three days, and yet most of these have suffered great pain in their intestines, I suspect that the weight of the bowels inflames the kidneys, and therefore diuretics are necessary. At all events, I have the credit of introducing a practice that has proved infallible, although my theory may be incorrect." On December 19th Wilson notes . . . "The sea prevents the portholes being open, which is also much against the horses. My handsome grey is now blind. The fever has fallen into his eyes, but as he gets strength daily I am in hopes to restore his sight, although the discharge is very acrid and copious." Probably another four horses died. On January 1st, 1806, the horses were reported to be "all well, except my grey that is not quite recovered."

As explained in Chapter III., the 20th Light Dragoons and the South Staffordshire Regiment (then 38th Regiment) were detached at Saldanha Bay under command of Major-General Beresford. "A heavy gale that ploughed the bay and ignorance of the shore, rendered the debarkation of the horses difficult, and the dusk of the evening had set in when the party began to march to occupy Theefontein, a post essential for the supplies of water, grain and cattle." Only 50 dragoons were mounted and these accompanied Major-General Beresford in a forced march to Capetown, *via* Groenkloof and Blauberg, arriving at their destination on January 10th just after the capitulation of Cape Town. The infantry and dismounted dragoons suffered severely during the march to Cape Town, especially the latter who not only carried kit but also saddles on their backs.

Although the regular cavalry of the Batavian Government was estimated at about 300, no figure is available as to the strength of the Burgher Cavalry. Indeed, Sir David Baird, in his despatch to Lord Castlereagh of January 12th (Theal, 1897-88, V. p. 270), stated: "The enemy's forces apparently consisted of about 5,000 men, the greater proportion of which was Cavalry and 23 pieces of cannon yoked to horses."

Cavalry being so important, it is not surprising that Sir David Baird

applied (letter of January 13th, 1806 to Viscount Castlereagh) for "an augmentation of my force by an additional body of Cavalry." In July there accordingly arrived the 21st Light Dragoons which in addition to taking over the horses of the 20th Light Dragoons obtained other remounts locally.

Since some of the Batavian Dragoons had unlawfully disposed of their horses to farmers, an order was issued (Proclamation of January

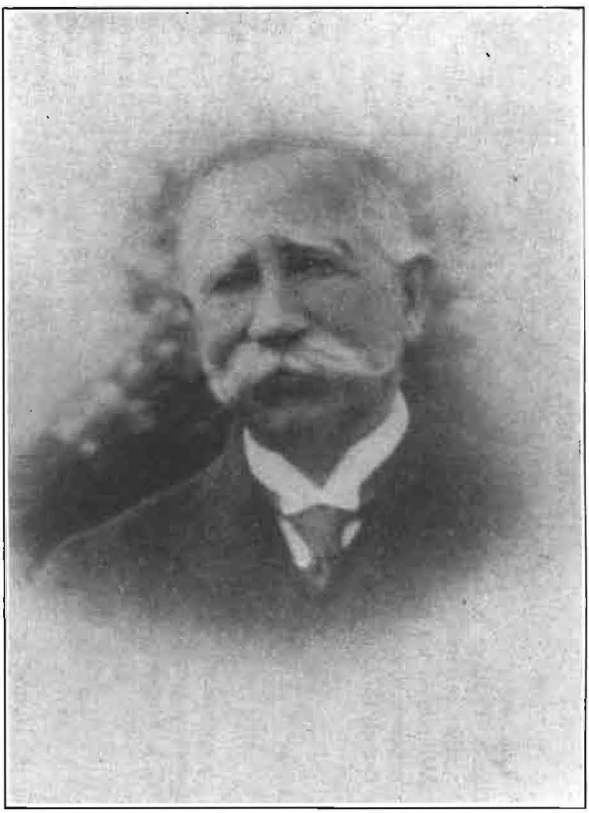

Fig. 18.
SAMUEL WILTSHIRE (1844—1933.
The first Colonial Veterinary Surgeon of Natal.

5th, 1806) instructing that such animals were to be forwarded "to the Cavalry stables in Capetown," within 10 days. See Fig. 3.

(b) Veterinary Literature.

The object of this section is to summarise the veterinary literature published up to April 1881, both in order to indicate the state of knowledge concerning communicable diseases, and to show the proportion contributed by members of the Army Veterinary Service.

Year	Subject or Title.	Author.	Publication.	Remarks.
1826	Rabies.	—	Information taken from *Commercial Advertiser,* August 19th, 1926, See p. 314 of *Het Nederduitsch Zuid-Afrikaansch Tijdschrift,* Deel III., 1876.	Case reported by Drs. Oosterzee, Wehr and Heurtley. A girl of about 11 was bitten by a dog, presumably at Capetown.
1854	Cases occurring in South Africa	J. Thacker. (James Thacker is incorrectly referred to as William in his obituary notice in the *Veterinarian* of 1877, p. 380).	*Veterinarian,* XXVII. The article dated October 2nd, 1853.	These four cases of disease in horses include two which are certainly glanders, one of mad staggers (phrenitis), and the last, enteritis with rupture of the colon. Thacker at the time was stationed at Kingwilliamstown, being V.S. to the 12th Lancers.
1855	Note on lung-sickness causing extensive ravages at the Cape.	—	*Veterinarian,* XXVIII., p. 334.	Sir George Grey had instructed G. A. Hutton, V.S., and Surgeon, to investigate.
1856	Contribution on horse-sickness (64).	W. J. Kingsley.	*Notes on the Horsesickness at the Cape of Good Hope in* 1854-55. Compiled by T. B. Bayley and published by Saul Solomon and Co., Capetown.	Kingsley was a poor observer, while Hutton, although serving as assistant surgeon to the 12th Regiment, recognised horse-sickness as a specific disease. Kingsley and Hutton were at Grahamstown. See *S.A. Med. Jl.* VII. (22) p. 746.
	Contribution on horse-sickness.	G. A. Hutton.	Do.	

(64) In an article, "The Mortality among the Horses and Mules in Abyssinia," by G. Fleming, M.R.C.V.S., Royal Engineers (see *Veterinarian* 1868, p. 184), the following passage occurs regarding horse-sickness at the Cape: "It must ever remain a striking and significant fact, illustrative of the high standard of cultivation in Cape Colony, that within a very few years 112 different authors published treatises respecting this complaint among the horses." For this reason only important references to horse-sickness will be given.

Year..	Subject or Title.	Author(s).	Publication.	Remarks.
1857	*Missionary Travels and Researches in South Africa.* (John Murray, London).	David Livingstone.	This work contained descriptions of nagana, horse-sickness, anthrax and rabies. *Glossina morsitans* and Bechuana cattle were also well described.	It is clear that Livingstone confused anthrax and horse-sickness, the latter of which he believed to occasionally affect cattle. It was V. S. Nunn in 1887 who first showed that the diseases were not identical.
1858	Purchase of Cape horses for Indian Army.	Bluebook sent to Editor of *Veterinarian.*	See *Veterinarian* XXXI., p. 543.	Col. Apperley purchased about 3,300 horses. Those for 12th Lancers averaged £23 17s. 7d.
1863	The horse-sickness of the Cape of Good Hope.	T. Paton.	Letter addressed to Editor, *Fort Beaufort Advocate.* Republished in *Veterinarian* XXXVI., p. 489.	—
1867	Horse breeding at the Cape and remounts for India.	T. Paton.	Letter dated May 25th, 1867, and addressed to Editor, *Kaffrarian Watchman.* Republished in *Veterinarian XL.*, p. 781.	—
1874	On the changes going on in the vegetation of Africa through the introduction of the Merino sheep.	Dr. J. Shaw, F.L.S.	See *Veterinarian,* (65) p. 815.	—

(65) Sir Frederick Smith, who thoughtfully sent this article, refers to another, entitled "Changes which Flocks and Herds undergo," presumably in the *Veterinarian.*

Year.	Subject or Title.	Author(s).	Publications.	Remarks.
1874	Report of the Commission on redwater.	Dr. Sutherland, Dr. Bonnar, J. W. Winter, M.R.C.V.S., and J. D. Nicholson	Govt. Notice 32 of 1874, *Natal Govt. Gazette.*	This report led to the appointment of the first state veterinarian in Natal, Samuel Wiltshire, who was designated Colonial Veterinary Surgeon.
1874	Report on glanders at Durban.	S. Wiltshire.	Govt. Notice 366 of 1874, *Natal Govt. Gazette,* December 29th, 1874.	—
1875	The canine distemper in South Africa.	W T. Black, Assistant Surgeon.	*Veterinarian,* p. 320, 1875.	—
1876	The hereditary transmission of glanders.	T. Paton.	*Vet. Jl.,* II., p. 115.	Although written after Paton had left South Africa, the paper describes glanders in a week old foal, the property of the Kingwilliamstown Stock and Producers Company.
1877	Report on redwater in cattle.	S. Wiltshire, signed March 4th, 1877.	Apparently published in *Natal Govt. Gazette,* but see *Veterinarian,* L., p. 555., 1877.	—
1877	Report on quarter-evil.	S. Wiltshire.	Govt. Notice 310 of 1877, *Natal Govt. Gazette.*	—
1878	Report on horse-sickness.	Board of three military officers, Pretoria.	See abstract in *Vet. Jl.* VII., p. 100 1878.	—

Yaer.	Subject or Title.	Author.	Publications.	Remarks.
1878	Report on horse-sickness.	S. Wiltshire, dated November 6th, 1878.	Govt. Natice 192 of 1878. *Natal Govt. Gazette,* June 25th, 1878. See *Veterinarian* LII, p. 33, 1879.	—
1878	Suggestions for the general management of horses and mules while on field service in Natal and the neighbouring countries with notes concerning their more common ailments.	B. L. Glover.	Issued as pamphlet. See abstract in *Vet. Jl.* VIII., p. 97 1879, of this and previous contribution.	—
1879	Poisoning of a horse by tea.	F. Duck.	*Vet. Jl.,* IX., p. 154.	—
1880	Remarks on epidemic diseases—Men and animals in the Colony of Natal.	Ross—Surgeon General.	*Transactions of the Epidemiological Society.* See *Veterinarian,* LXI., p. 150.	—
1880	Poisonous plants in Zululand and Afghanistan.	Geo. Fleming.	*Vet. Jl.,* X., p. 65.	Some horses of the 17th Lancers died from "tulp" and the article deals with specimens sent to England.
1880	Report on a visit to Fort Weeber and Secocoeni's Country for the purpose of taking notes on horse-sickness.	R. Moore.	*Vet. Jl., X.,* p. 320.	Moore who was stationed in Pretoria went to the Third Sekukuni War, not on instructions from the P.V.S., but as a volunteer.

Year.	Subject or Title.	Author.	Publications.	Remarks.
1880	Observations on cases of horse-sickness.	R. W. Jackson and R. Moore.	Pamphlet printed by Messrs. Coppen, Deecker & Co., Pretoria, and re-published as Govt. Notice 243 of 1880 in *Natal Govt. Gazette* June 15th 1880.	First professional veterinary publication of the Transvaal.
1880	General Report of Army Veterinary Department, Zulu War, 1879.	T. P. Gudgin, Principal Veterinary Surgeon (local).	Issued as an independent report, a copy of which is in the library of the S.A.V.M.A., Pretoria. Republished in *Vet. Rec.* Oct. and Nov., 1910.	—
1880	Clinical notes on the South African horse-sickness.	T. A. Killick.	*Vet. Jl.*, XI., p. 312.	—
1880	Hydrate of chloral in veterinary practice.	J. Cammack.	*Vet. Jl.*, XI., p. 165.	—
1880	Heartwater in sheep and goats.	S. Wiltshire.	*Vet. Jl.*, XI., p. 312.	—
1881	The horse-sickness of South Africa.	M. F. Healy.	*Vet. Jl.*, XII., p. 78.	—

In addition to the above veterinary publications there are, of course, (a) the annual reports of Samuel Wiltshire, Colonial Veterinary Surgeon, Natal, for the period 1875 to 1880. Only the report of 1880 has been traced, namely in the *Natal Blue Book for* 1880. The *Veterinarian* (LII., 1879) refers to the previous report, this being dated June 30th, 1879. And (b) the annual reports of William Catton Branford, Colonial Veterinary Surgeon, Cape of Good Hope, for the period 1876—1879, and of Duncan Hutcheon, his successor, for 1880. Three reports were issued by Branford, namely, for 1876 (G 8—'77), 1877 (G 13—'78) and 1878—'79 (G 54—'79). Hutcheon's first annual report is for 1880 (G 52—81). Another valuable report is that of the Commission to enquire into the Diseases of Cattle and Sheep (G 3—'77).

Of particular interest are the legislative measures enacted by the various South African Governments, as follows :—

Cape Colony (66).

Ord. 5 of 1844.—Ordinance to prevent the spread of horse disease called glanders.

Ord. 1 of 1853.—Ordinance to prevent the spread of cattle disease called "longsiekte."

Act 18 of 1865.—Act to prevent the introduction into this Colony of malignant diseases affecting horned cattle.

Act 3 of 1867.—To continue the application of Act 18/1865 until December 31st, 1867, and its provisions to apply also to sheep.

Act. 7 of 1866.—Applying Ord. 5 of 1844 to mules and asses.

Act 5 of 1867.—Again extending Act 3 of 1867.

Act 20 of 1868.—To repeal Act 5 of 1867 and to make provision, relating to contagious and infectious diseases affecting cattle, sheep or other domestic animals.

Act 31 of 1874.—To prevent the spread of scab disease in sheep and goats.

Act 2 of 1881.—For preventing the spread of contagious and infectious diseases among cattle and other animals.

Natal.

Ord. 6 of 1854.—To prevent the importation and introduction ..... of diseased cattle and to provide measures of protection against the spread of infectious diseases among cattle.

Law 8 of 1864.—To prevent the spread of the horse disease called glanders.

Law 32 of 1865.—To prevent the spread of the scab disease.

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(66) There are many "placaats," especially concerning scab in sheep, dating as far back as 1693.

Law 13 of 1866.—To strengthen and extend the provisions of Ordinance 6 of 1854.
Law 9 of 1871.—For the better prevention of lungsickness among cattle.
Law 21 of 1872.—To amend Law 9 of 1871.
Law 29 of 1874.—To remove nuisances from the public roads and to prevent the spread of infectious and contagious diseases amongst catle.
Law 26 of 1878.—For the better prevention of disease in sheep called scab.

Orange Free State.

1854.—Lungsickness in cattle.
1875.—Redwater of cattle.

South African Republic.

1854.—Lungsickness in cattle.
1870.—Lungsickness in cattle.

After perusing the above literature, the impression is gained that the management of livestock was exceedingly primitive. Regarding communicable diseases, while some were easily recognised clinically or after post-mortem examination, e.g. lungsickness and redwater, there was generally much confusion in differentiating between anthrax, horse-sickness and some of the maladies now known to be transmitted by ticks.

(c) Notes on Pioneer Members of the Profession who were not in the Army Veterinary Service.
(Up to March, 1881).

(1) *G. A. Hutton* was not only a medical man, being assistant surgeon, 12th Regiment, at Grahamstown, but also a qualified veterinary surgeon, having graduated at London in 1853. On the spread of lung-sickness in the Eastern Province, after its introduction from Holland in 1854, he was called upon by the Governor, Sir George Grey, to investigate the problem. His report has not been traced. He also submitted a report on horse-sickness which is reproduced by Bayley (1856). It is significant Hutton believed horse-sickness to be "a specific disease." He died in 1889.

First Private Practitioners.

(2) *James W. Winter.* Winter qualified at London in 1836. According to Smith (*The Early History of Veterinary Literature,* IV. (1823-1860) p. 121, 1933) he published in 1846, *The Horse in Health and Disease.* a book which he describes as "remarkable both for its culture and the professional knowledge displayed." Winter was "vet-

erinary Surgeon to Mehemet Ali, and Ibrahim Pasha of Egypt." He afterwards settled in Natal and was in the country by 1873, for he was one of the three members of the Redwater Commission (see Govt. Notice 32 of 1874 in the *Natal Govt. Gazette*). Winter's Condition Powders were well known in Natal forty years ago. He subsequently proceeded to Australia where he died in 1886.

(3) *John Cammack* appears to have been the first private practitioner in Cape Town. According to Mr. A. H. Gentle, M.R.C.V.S. (who came to South Africa in April, 1881) Cammack was in private practice in Kimberley in November, 1882. Gentle believes that at this

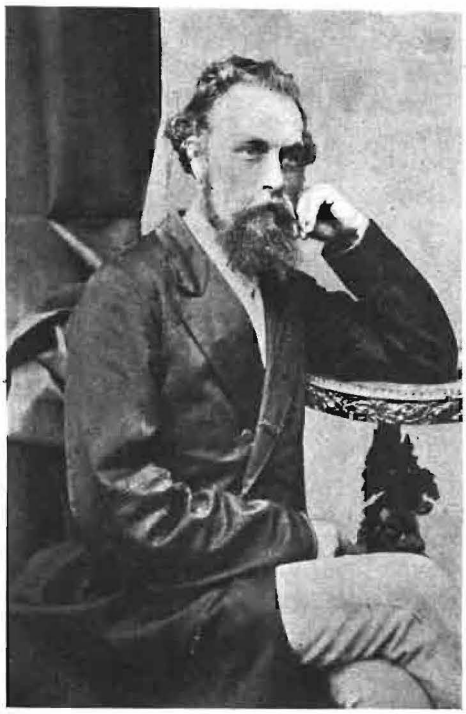

Fig. 19.
WILLIAM CATTON BRANFORD.
The first Colonial Veterinary Surgeon of Cape Colony.

time there was an M.R.C.V.S. in practice at Cape Town. Cammack contributed an article on "Hydrate of Chloral in Veterinary Practice," in the *Vet. Jl.* of Aug. 1880, from Cape Town. He qualified at the Royal (Dick) Veterinary College in 1872, and died in Johannesburg in 1911, aged 67. It is clear in March 1878, Cammack was still in practice in Staffordshire (*Vet. Jl.*, p. 163). He appears to have been "the first man to recommend preventive treatment (for "lamsiekte") and the use of bone ash

for the purpose. This observation is made by Mr. T. D. Hall in his presidential address to Section C of the S. African Association for the Advancement of Science in 1934 (*S. Afr. Jl. Sc.*, XXXI.) In the bibliography of the address, he quotes Cammack's paper "A Periscope from a Pastoral Plane," (*S. Afr. Agriculturists' Almanac*—1889).

First Colonial Veterinary Surgeons.

(4) *Samuel Wiltshire* [67] was born at Gloucester on 24th May 1844 being the fourth son of Henry Wiltshire whose father lived at Shokewick House near Bath, famous for its association with Thomas Gainsborough. His love of adventure led him to Nova Scotia and then to the United States during the Civil War (1861-65); but he later turned to England where he took up farming. Shortly afterwards, however, he decided to study for a veterinary surgeon although he would have preferred a medical career. After qualifying at the Royal Veterinary College, London, on April 17th 1872, he was appointed House Surgeon, and later acted as *locum tenens*, but this was not for long as in 1874 he accepted "the office of Colonial Veterinary Surgeon and Inspector of cattle at the Port of Natal." Marrying in September he sailed immediately afterwards to South Africa, taking up his duties on 28th October of that year.

When it is considered that diseases such as glanders, lungsickness and redwater were rampant, his early difficulties can be imagined. From February 1880 all sheep inspectors were placed under his supervision, and the control of scab was added to his duties. He travelled about the Colony on horse-back and was some times away from his headquarters [68] for several weeks at a time.

During the Zulu War (1879) he greatly assisted the Military authorities and received the Zulu War medal. Of his pioneer work and scientific observations more will be written later, but it will suffice to say that he was dignified, diligent and possessed of more enthusiasm than would be expected in the circumstances in which he laboured. Grudging in the financial support accorded him, the Natal Government expected him to produce a panacea for all the diseases of stock in Natal, whereas stringent legislation, rigidly enforced, would have banished several of the scourges of Natal, e.g. lungsickness, scab and glanders.

On the institution of Responsible Government in 1893, Wiltshire continued to hold his post, but in 1896 he was retired on a meagre pension of £200 *p.a.*, whereupon he returned to England and settled there, interesting himself in religious and educational work. Now and again

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(67) Samuel Wiltshire's daughter, May, by his first marriage, has kindly provided much of this information.

(68) Situated on the site of the present Colonial Buildings, Church Street, Maritzburg.

he paid a visit to the United States or Canada, and after the Boer War returned to Natal for a short period, but eventually made his home at Longhope, Gloucester, where he died on March 1st, 1923.

While in the Natal Civil Service he lived in Maritzburg, but later built a house, The Rhydd at Mountain Rise, where he resided until his first wife's death, when he took a house in Church Street. Later he again lived at Mountain Rise, his residence being known as Wiganthorpe, but on being provided with a laboratory he moved to Allerton, which is still the Natal Veterinary Laboratory. (See Fig. 18).

(5) *William Catton Branford.* Just as Wiltshire was the first colonial veterinary surgeon (now Government veterinary officer) of Natal, so was Brandford the first State appointment in the Cape Colony. He qualified at London in 1857, and in 1869 succeeded Thomas Strangeways as Professor of Anatomy at the Royal (Dick) Veterinary College. In 1876 he arrived at the Cape and until 1879 was sole state veterinarian. His three "annual" reports, 1876, 1877, and 1878-79, indicate that he was an able and energetic man. Unfortunately he left the Cape under a cloud and in 1882 was struck off the Register of the Royal College of Veterinary Surgeons. See Fig. 19, for which thanks are due to Dr. Fred. Bullock, who borrowed it from Major A. Baird, R.A.V.C.

(6) *Duncan Hutcheon* (1842-1907) . Born near Peterhead, Scotland, on June 27th, 1842, he graduated at the Royal (Dick) Veterinary College in 1871. He was appointed Colonial Veterinary Surgeon of the Cape Colony on March 2nd, 1880 and so highly were his services valued that in August 1905 he was made Acting Director of Agriculture, which post was made permanent the following year. His death on May 14th 1907 was a great loss not only to the profession but to South Africa. His final resting place is Mowbray Cemetery. He raised the profession from obscurity to honour. For detailed obituary see *Cape Agr. Jl.* XXX pp. 736-739, 1907. (See Fig. 23).

First Colonial Permanent Force (C.M.R.) Veterinary Officers.

(7) *Thomas Butcher Scott Dawkins* qualified at the London School on April 19th, 1872. He joined the C.M.R. as Veterinary officer on Aug. 29th, 1879. When on Jan. 29th, 1880 the regiment was divided into Right and Left Wings, Dawkins was attached to the Right Wing, but it was certain he left before amalgamation of the two wings in 1884. It is probable he took part in the Moirosi War (1879) and 5th Basuto War (1881). He is described by Mr. A. H. Gentle, M.R.C.V.S. (who also served in the C.M.R. for a short peroid) as "a tall distinguished looking man." Later he resided in Natal and died at Pietermaritzburg in 1912. It is believed a daughter survives him and lives in the Richmond district.

(8) *George Garnett* qualified at London in 1875 and served in the C.M.R. from 7th May 1880 to 31st March 1882, during which it is believed he took part in the Basuto War of 1880-81. He died in 1920.

(9) *Thomas Henry Merrick* qualified at London in 1874 and also served in the C.M.R., participating it is believed in the Basuto war of 1880-81. During the early nineties he was not only President of the Midland Counties Veterinary Medical Association but also member of the Committee of the R.C.V.S. He became a Fellow in 1891. He died in 1894.

(d) Three Colonial Campaigns.

While the majority of the campaigns listed in Table II were undertaken by the Imperial Authorities, three were conducted by the Cape Colonial Government, *viz.* Moirosi War (1879), Basutoland Campaign (1880-81) and the Pondomisi Rising in the Transkei (1880).

Since it is probable that veterinary surgeons attached to the C.M.R. participated (at any rate in the first two), a few comments will be made concerning each.

Moirosi War.

At the end of January 1879 the Baputi clan of Basutos under Moirosi, living on the Quthing-Herschel border, went into rebellion. Among the colonial troops called out were the newly created Cape Yeomanry [69]. "Several skirmishes followed in the district of Quthing (in Basutoland) and finally the Baputis were driven to take shelter on Moirosi's Mountain" (Hook p. 266). A long siege followed during which the Yeomanry and Burghers were recalled. Ultimately the stronghold was captured on November 20th by the C.M.R., Wodehouse Rangers and Native levies.

Basutoland War [70].

This was precipitated by the decision of the Cape Government to disarm the Basutos, who since 1871 had been administered by the Cape Government. Owing to threats of rebellion the C.M.R. were sent from Kingwilliamstown to Basutoland at the end of July and August.

The campaign was characterised by obstinate defence at the four government centres of Maseru, Mafeteng, Mohali's Hoek and Thlotse Heights (Leribe). Mohali's Hoek was relieved on October 3rd but before Mafeteng was relieved, it was necessary for the succouring force to beat off a determined attack by the enemy at Kalabani on October 19th.

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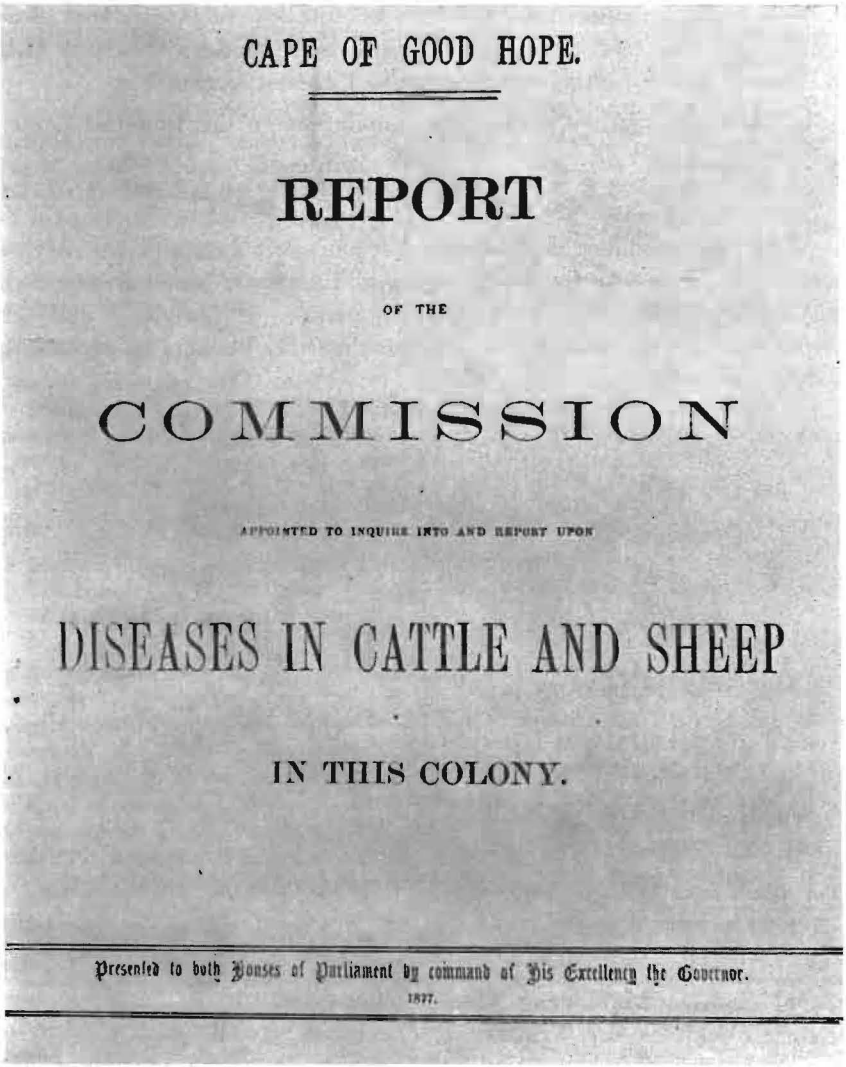
(69) Three V.Cs. were won in this campaign, Sergt. Scott, Peter Brown and Surgeon-Major Hartley, all of the C.M.R.

(70) Surgeon McCrea won the V.C. at Tweefontein.

The garrison had been "reduced to feeding on horseflesh and kaffir corn, as the Basutos captured all the slaughter stock on the 21st September, and all other stores were exhausted" (Williams p. 41). While the Basutos were not able to capture fortified posts, the Colonial troops also failed to inflict a decisive defeat; in fact, encounters at Makwaisberg


CAPE OF GOOD HOPE.

REPORT

OF THE

COMMISSION

APPOINTED TO INQUIRE INTO AND REPORT UPON

DISEASES IN CATTLE AND SHEEP

IN THIS COLONY.

Presented to both Houses of Parliament by command of His Excellency the Governor.

1877.

Fig. 20.
TITLE PAGE OF A RARE REPORT ISSUED BY A COMMISSION WHICH INCLUDED BRANFORD.

(Oct. 31st) and Kolo Mountain (Nov. 13th) were disasters. At Tweefontein (Jan. 14th 1881) "A column of 1,000 under Carrington..... was only saved from defeat by the stand made by the Yeomanry, Duke of

Edinburgh's Own Volunteer Rifles, and the C.M.R." (Williams, p. 44). Better fortune attended engagements on Feb. 15th (Ramibidikwa's village) and April 11th, and hostilities terminated on April 18th "with the virtual submission of the Basutos."

Mounted troops participating in the campaign (including the C.M.R. and Yeomanry) at one time 7485 [71]; but they were insufficient to deal with the well mounted Basutos, who, with more modern weapons (Martini-Henry) and superior numbers proved almost irresistible.

In 1884 the country was again transferred to the Imperial Government.

Transkei.

When the rebellion in Basutoland broke out a sympathetic rising occurred in the Transkei, the Pondomisi and Tambookies being responsible. "In October 1880, Mr. Hope, the Magistrate of Qumbu" and other Europeans, were murdered. At one time matters became so serious that

Fig. 21.

BADGE OF NATAL POLICE (1874—1913).

For which force Wiltshire performed veterinary duties.

Fig. 22.

BADGE OF CAPE MOUNTED RIFLEMEN (1878—1913).

In which Dawkins, Garnett, and Merrick were veterinary surgeons.

General Charles M. Clarke, Commandant-General of the Cape forces left Basutoland for the Transkei. The local officials with C.M.R. and levies, however, did their work so efficiently that in a short time peace was established.

As indicated in Table II(a medal with clasps for Basutoland, Transkei (and later Bechuanaland 1897) was issued by the Cape Government.

(71) Including the Kimberley Horse.

(e) References Concerning the History of the Veterinary Profession.

Title.	Periodical.
Cape Colony	
Cape Colony Volunteers (1857-1913)	*Vet. Jl.*, Nov., 1932
The Pre-Union Police Forces: (a) Cape Colony	*Vet. Rec.*, June 11th, '32
Cape of Good Hope Veterinary Medical Society	*Jl. S.A.V.M.A.* ii (2) '32
Natal	
Natal Volunteers (1854-1913)	*Jl. S.A.V.M.A.* v (3) '34
The Pre-Union Police Forces: (b) Natal	*Vet. Rec.*, Oct. 15th, '32
Natal Veterinary Medical Association	*Jl. S.A.V.M.A.* ii (2) '32
Natal Act 21/1899 and the Natal Veterinary Board	*Jl. S.A.V.M.A.* v (1) '34
Vet. Account of the Zulu War	*Vet. Rec.*, Jan. 5th, '35
Orange River Colony	
The Pre-Union Police Forces: (d) Orange River Colony	*Vet. Rec.*, Oct. 22nd, 32
Transvaal	
Transvaal Volunteers (1902-1913)	*Jl. S.A.V.M.A.* iv (1) '33
The Pre-Union Police Forces: (c) Transvaal	*Vet. Rec.*, Oct. 22nd, '32
Transvaal Veterinary Medical Association	*Jl. S.A.V.M.A.* iii (1) '31
Veterinary Affairs During the First Annexation (1877-1881)	*Vet. Jl.*, Feb., 1934
General	
The Repatriation Departments and their Veterinary Organisation	*Vet. Rec.*, Sept. 27th, '30
The Volunteer Services of the Empire and the Boer War (1899-1902)	*Vet. Rec.*, Aug. 26th, '33
The Struggle for Legal Recognition	*Jl. S.A.V.M.A.* i (4) '30
Theses for the Doctorate	*Jl. S.A.V.M.A.* iv (3) '33
Theses for the Fellowship of Interest to S. Africa	*Jl. S.A.V.M.A.* iii (2) '32
Autographs of Veterinary Interest	*Jl. S.A.V.M.A.* iv (3) '33
Coats of Arms of Veterinary Interest	*Jl. S.A.V.M.A.* v (2) '34
The Coat of Arms and Motto of the S.A.V.M.A.	*Jl. S.A.V.M.A.* iv (2) '33
Veterinarians in German South-West Africa	*Vet. Jl.*, June, 1935
South African Medical Pioneers in Veterinary Service	*S.A. Med. Rec.*, Jan. 25th '33
A Pioneer of Veterinary Service in South Africa	*The Sun and Agr. Jl. of S.A.* Jan. 1930
Brief Biographies of some members now dead	*Jl S.A.V.M.A.* iii (2) 1932
In Preparation.	
Durban and Municipal Veterinary Hygiene	— —
The Veterinary Side of the Kaffir Wars	
The Army Veterinary Service in South Africa, 1881-1914	

(f) General Conclusion.

In the preceding pages reference has been made not only to the genesis and development of the veterinary profession in South Africa, but also to associated matters, such as campaigns, movements of cavalry, stock diseases, early legislation, the beginnings of veterinary literature,

and the creation of state (civil) veterinary divisions. Outstanding facts are :—

(a) the influence of the Army Veterinary Service until 1873, when the Natal civil authorities began to appreciate the value of the profession. In fact, its history during the period under review is largely the history of the cavalry. So urgent was the need for veterinary surgeons in the Army that Edward Coleman, Principal of the London Veterinary College and P.V.S. Cavalry, actually reduced the period of study

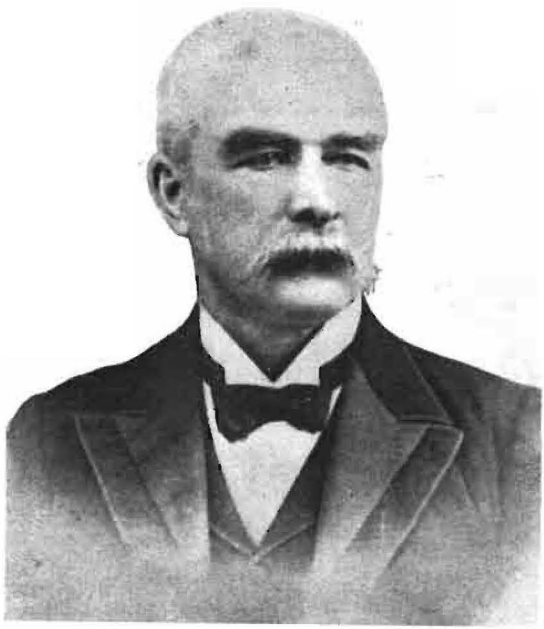


Fig. 23.
DUNCAN HUTCHEON (1842—1907).
Who succeeded Branford in 1880 as Colonial Veterinary Surgeon, Cape Colony.

of three years (Mc Fadyean 1923), laid down by Sainbel, to one year (see footnote 10).

(b) the rôle played by livestock in the causation of war, especially in the native campaigns. On the one hand the Europeans possessed the stock but not sufficient grazing, on the other the natives owned the grazing but not sufficient stock !

(c) the difficulty in obtaining direct evidence from literature of the influence of the profession until the early fifties. The reason is that " there was no professional periodical published until 1828." Further,

the Army Veterinary Service being entirely regimental until 1878, whatever reports were furnished are not available for historical research. With regard to photographs a feature has been made of early title pages, for, until comparatively recently, library organisation in South Africa has been somewhat primitive and early veterinary reports are rare. It is to be regretted that apparently no portraits exist of stalwarts such as John Percivall, F. Cherry, W. Stockley, J. Wilkinson, and of course, our own pioneers, especially from T. Burrowes down to J. Thacker.

In the circumstances therefore, this compilation is to be considered as merely an outline of events of veterinary interest from 1795-1881. Given co-operation between the veterinary profession, the various South African archives and the War Office, there is no reason why a more complete record should not be written.

A lesson to be learned is that in spite of administrative inertia, misrepresentation by those who were jealous, and arrogance on the part of some who considered themselves superior, the Army Veterinary Service by sheer perseverance, has consolidated its position and obtained step by step the status of its medical and combatant colleagues.

Finally, although there was nothing spectacular about the A.V.S., it is clear that it exerted quietly a great influence in the improvement in the livestock industry in South Africa. Indeed, apart from the mining engineer, no other calling has done so much for the country [72]. Thus the motto *pristinae virtutis memores* aptly expresses the appreciation of the present generation to those who blazed the trail.

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[72] A history of the profession from 1881 will more than justify this assertion.

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An Experience with Canine Biliary Fever.

F. J. DUNNING, F.R.C.V.S., Stellenbosch.

Subject: Bull terrier, weight about 40 pounds.

Diagnosis: Biliary Fever, confirmed by smear examination.

7th May 1935. Temperature 105°F. 1 cc. of a 0.25% solution of Akiron was given, viz. half the dose recommended. Patient promptly fainted much to owner's concern but recovered and was taken home.

From the 8th to the 12th the temperature was normal, and condition improving.

The temperature on the 14th was 104°, 15th 103°, 16th 102.4°, and on the 17th 105.9°, when the animal received only ½ cc. of Akiron in view of previous fainting. No shock. The temperature dropped to normal, but the dog fainted in the house on the 20th. On the 23rd the temperature had risen to 104 and 1 cc. of akiron was given. No shock. On the 24th the animal fainted in the house. Temperature 103°. On the 26th temperature 101°. Fainted again.

From now onwards the temperature remained more or less normal until 19/7/35, with an occasional faint at exercise. At no time could unusual heart sounds be detected.

At first Easton's Syrup and then Parrish's food were administered daily as tonics. This was changed later to *Liq. Arsenicalis* and *Tr. Nux. Vom.*

The owner was giving the dog a pound of meat and bone daily. At no time did he lose condition appreciably. Even with a high temperature the membranes remained pink, expression bright with no depression. Smears taken at different times showed blue staining erythrocytes.

A further relapse occurred on 19/7/35. Smears shewed anaemia, *P. canus* circular from infrequent. Temperature 104° F. Received without shock Akiron ½ cc. of 0.25% Solution. Temperature dropped to normal and recovery since has been almost uninterrupted. The dog therefore received four injections of Akiron at various intervals over a period of almost eleven weeks.

I wonder whether better results would have been obtained if the initial injection had been Trypan Blue or if I had the courage to give 2 cc. Akiron. My experience so far has been that Akiron quickly sterilises the blood stream, reduces the fever, and brings about many spectacular recoveries even in small doses, but relapses are frequent. In nondescript dogs, crossbreeds, mongrel strains there is no difficulty, but purebreds are prone to succumb either shortly after injection from shock

or subsequently at some later period up to a month from a relapse often associated with haemoglobinuria. Some of these latter cases could be saved if owners brought them for further attention and treatment. Biliary fever in this area occurs principally in the autumn and spring when the weather is cold and wet, and climatic conditions are unfavourable for malarial types of diseases. In the original instructions for Akiron a second injection in the case of a relapse is recommended and no evil results are suggested. In the newer instructions however definite warnings are advisedly given in the light of which I consider myself fortunate that the dog survived the repeated injections which probably would not have been the case had the owner not exercised extreme care in nursing with enforced quietness.

During treatment I attributed his fainting to the anaemic condition of the blood but perhaps it was due to heart shock from Akiron injections. Incidentally no definite statement is made as to the length of time a solution will maintain its efficacy under ordinary room conditions. I made up my original solution of 100 cc. on the 15th March 1935, being sufficient for about 100 average dogs. At the present date, 27th August, 1935, its physical appearance is the same and it is still in use with satisfactory results, and must have been opened almost 100 times. Can anyone give information on this point?

IMPERIAL BUREAU OF ANIMAL HEALTH.

Veterinary Laboratory,
Ministry of Agriculture & Fisheries,
Weybridge, Surrey.

Dear Sir,

Two complete volumes of *Index Veterinarius* have been published and the first number of Volume 3 has just been issued. It would appear to be worth while now to invite the help of those who use the *Index* in order to ascertain whether its usefulness can be increased.

The text has been laid out in a form in which it is hoped that the references can easily be traced. This has involved the adoption of certain nomenclature and systems of classification that may not be used or followed by some readers, though it is believed that the information required is easily found.

Subjects on which, among others, the views of readers would be welcomed are:—

System of classification.
Nomenclature.
Subjects and interests covered.
Additions to or cancellations of publications indexed.
Layout.

I would be glad to receive the opinions of readers on the above points and their views regarding any other improvements that might be introduced.

Yours faithfully,

(signed) W. A. POOL, Editor.

THE ASSOCIATION.

Report of Committee of S.A.V.M.A. on Horse-breeding *

In terms of the resolution passed at a meeting of the S.A.V.M.A. held at Onderstepoort we submit herewith a report with recommendations for the consideration of the Government regarding measures to be adopted in order to assist the breeding of light horses in South Africa.

Your Committee realises that this is a subject which has previously been brought to the notice of the Department of Agriculture. No apology, however, is needed for introducing it again by the S.A.V.M.A. whose interests are so closely allied to the horse-breeding industry. Further this is a national industry which deserves the sympathetic consideration of both the Government and the agricultural community.

The horse-breeding industry in the Union is in a parlous and unsound condition. There is a marked deterioration in the type of utility horse now being produced as compared with that produced prior to the last war. This is very evident from the difficulty experienced in obtaining suitable remounts for defence and police purposes. There is also considerable difficulty in getting good polo ponies. This game is becoming more popular in South Africa and the number of Polo Clubs is steadily increasing, which means a ready market for hundreds of ponies every year. The right type of pony is essential to compete successfully in this game and players are prepared to pay well for them, but at present a good pony is difficult to procure.

Amongst the chief causes of the decline of the horse-breeding industry are the following :—

(a) Lack of suitable markets.
(b) The use of mechanical transport.
(c) Lack of good sires.
(d) Horse-sickness.
(e) Exhorbitant taxation of racing.
(f) Indiscriminate breeding methods.
(f) The drain caused by the last war.
(h) Lack of interest by the officers of the Department of Agriculture in horse-breeding.

The following suggestions are submitted for remedying the above conditions :—

(a) **Markets :** As the mechanisation of transport has reduced local markets, attempts should be made to find markets in other countries, e.g. India, Mauritius, and neighbouring African territories.

* Amended and received for publication 29/8/'35.

It is suggested that the needs of these countries be ascertained immediately by communicating with the respective Governments.

In India a market could be developed for :—

(i) Military remounts and artillery horses.
(ii) Polo ponies.
(iii) Race horses.

Items (i) and (ii) are now being supplied by Australia and there are indications that this country cannot continue to meet the demand. In view of the unsettled state of things on the Indian frontier, the demand for cavalry, artillery and "pack" animals is likely to increase. There is a large market to-day in India for polo ponies, and also race-horses. The latter are chiefly supplied from England. It is pointed out that the right type of unmade, but broken polo pony will sell readily in India for £75.

There is also a likely market to-day in East Africa and other African territories, while there is in England an almost unlimited demand for polo ponies which are at present being supplied from the Argentine. Good prices are paid for polo ponies as polo players are mostly gentlemen of good financial standing, but they demand a good article. South Africa is not breeding this class of animal to-day.

(b) **Mechanical Transport.** Equine transport is to-day replaced to a great extent by mechanical means. However, circumstances may arise when large numbers of horses suitable for remount purposes may be required and they will not be available unless horse-breeding is encouraged from a national standpoint. This was done in Great Britain and Germany before the Great War. The horses that were thus available were indispensable when the sudden outbreak of hostilities occurred. In South Africa the general adoption of mechanical transport is not a practical proposition in case of war, owing to the natural difficulties encountered in this country.

In some big cities in Great Britain horses are replacing motors for hauling light delivery vans where frequent stoppages are necessary.

(c) **Lack of suitable sires :**—At one time the Government imported suitable sires for distribution in this country and we are of opinion that it was a retrograde step to stop this importation. The average farmer who is not in touch with horse-breeding overseas does not know how or where to get suitable sires. It is in this respect that the Government can assist: (a) either by selling or leasing sires to breeders or farmers' associations, or (b) by placing them at a Government Agricultural School or other convenient centre where the farmer can send his mares to be served at a reasonable figure.

An alternative would be to subsidise approved sires owned by breeders or Agricultural Societies.

It is recommended that all mares sent to sires in which the Government has an interest should be approved by an officer of the department as being of the right type to breed from. This selection of suitable mares could be carried out easily at the various agricultural shows and thus help to revive interest in the horse classes. At present these are badly represented compared with the excellent exhibits of 10 years ago, when these horse classes were a great " draw " for the public.

An easy system of registration of selected mares for future identification could be devised. The question of funds for the above scheme is discussed under (e).

(d) **Horse-sickness.** This disease has for generations been the worst equine disease we have had to contend with. Fortunately researches which have been conducted at Onderstepoort with a view of finding a suitable vaccine, have been successful,and now that a simple and reliable method of vaccination is available large tracks of country at present unsuitable for other types of live stock could produce good horses. Further, the cheapness of land in these areas will render horse-breeding a profitable branch of farming.

(e) **Taxation of racing :**—The committee is of opinion that horse racing directly and indirectly affects the breeding of utility horses. Many thoroughbred entires make suitable sires when no longer needed for racing and many thoroughbred mares are suitable for breeding polo ponies. Thoroughbreds that are not good enough for racing or for the breeding of race horses may be of value for polo and remount purposes.

We, therefore, strongly recommend that the Government should use its influence with the Provincial authorities and endeavour to get a reduction in the taxation at present levied on horse-racing. If taxation of horse racing must be continued as a means of revenue, it appears desirable and just that a portion of such revenue be returned to the horse-breeding industry, as is done in other countries where the " tote " operates. Such a portion of the " tote " tax can be utilised for the purchase or subsidisation of suitable sires as discussed under paragraph (c). It is suggested that a horse-breeding fund be established and a definite percentage of the totalisator tax be put aside to form the nucleus of such a fund, which could be further augmented by income from the lease or sale of sires.

(f) **Breeding:**—There appears to be no doubt that indiscriminate breeding has caused much deterioration in our horses. A definite policy is necessary and farmers should be advised as to how to proceed. To accomplish this the Government must organise the industry which deserves the same interest as is shown in other branches of farming. Farmers should be taught the principles of correct breeding, mating, selection and management.

At the present time the horse most urgently required in South Africa is a utility horse; a horse with quality, size and strength, that can be used either for riding or driving. This type is suitable for remount purposes. The horse bred in this country to-day lacks quality, constitution and bone owing to the indiscriminate methods of breeding adopted by farmers. It is felt that it is only necessary to produce a suitable type of horse and exploit the available markets to establish the horse-breeding industry as a sound paying proposition. In this connection the limitations of the country are realised, but there are large areas in the Cape, Transvaal, Free State and Natal which are suitable for horse and mule breeding. Further with the advent of a cheap and simple method of vaccination against horsesickness the moment seems propitious to stimulate the necessary enthusiasm amongst the horse loving farmers of the country.

It must be distinctly understood that the breeding of thoroughbred horses is not advocated as an economic proposition for the average farmer. The successful breeding of thoroughbreds is only possible for the few who make a special study of breeding, mating, management and selection. For these it is a highly profitable farming venture.

The use of good thoroughbred stallions mated to the best of our native mares would in a short time help to re-establish our horses and eliminate our present chaotic methods of horse breeding. In this matter it is felt that the Department of Agriculture should give a lead to farmers who are at present struggling to breed horses without being able to obtain the most desirable type of sire.

The draught horse has not yet found its proper place in farming operations in South Africa. However, now that our hopes in connection with the new method of vaccination against horse sickness have been realised, it is felt that use of heavy horses for farm work will be increased in the near future. Attempts are being made to supply the present needs of farmers, who require heavy horses, from the small Percheron studs at some of the schools of agriculture. This is an excellent scheme, but the present operations in that direction should be greatly enlarged. The Percheron is considered the most suitable heavy breed for South African conditions. This breed and its crosses have proved highly efficient under the environmental conditions met with in this country. Further the mules bred from Percheron crosses are excellent, being powerful, bigboned and active.

Mule breeding is another matter which should receive serious attention. Suitable mules have always been a good source of revenue to their breeders, even in times of abnormally low prices. Good markets for mules are still open in South Africa. Unfortunately our requirements for mules are met by the speculator instead of directly by the farmer. Stimulation of mule breeding will in time lead to stimulation

of the breeding of the Catalonian. However, there is evidence of improvement in this direction recently. Farmers are beginning to realise the value of mule-breeding as a sideline, without any advocation by the officers of the Department of Agriculture, hence, a few of the farsighted individuals have again begun to breed Catalonians.

We are of opinion that if action is taken on the above lines much good may result and this important branch of farming may again be put on a sound commercial basis. We submit our recommendations for the sympathetic consideration of the Minister of Agriculture.

(Sgd.) J. H. Melck,
J. Quinlan,
J. I. Bush,
(Members of Committee).

OBITUARY.

John Tweedale Dalling.

Mr. Dalling, of 57, Second Street, Boksburg, was 65 years of age at the time of his demise (11/6/35), having been born in Great Britain on 11th February, 1870. He studied veterinary science but did not qualify. He came to South Africa 37 years ago and for the greater part of that period practised in Boksburg. Prior to that he assisted his late brother, T. Dalling, M.R.C.V.S., at Bathgate, Scotland.

He was one of the few applicants who was successful in being registered in terms of Section 12 of the Veterinary Act (No. 16 of 1933).

Minutes of Council Meeting, S.A.V.M.A., held at Polley's Hotel, Pretoria, at 7.45 p.m. on 11/9/35.

Present:—Dr. H. H. Curson (vice President), Messrs. R. du Toit, (Hon. Sec. Treas.), A. C. Kirkpatrick, P. J. du Toit, P. J. J. Fourie, A. D. Thomas, C. J. van Heerden, A. M. Diesel, D. G. Steyn and M. H. V. Brown.

1. **Minutes of Council Meeting held on 27/5/35.** These were taken as read and confirmed.

2. **Matter arising out of these minutes.**

(a) *Proposed Government Commission.*

The Secretary briefly reviewed the position stating that the last letter received from the Secretary for Agriculture indicated that there was no chance at present for such a commission being appointed. Dr. du Toit said that especially in view of the present shortage of staff there was little likelihood of part time appointments for Government Veterinary Officers being considered. Dr. Fourie discussed the matter from the point of view of the private practitioner and thought that any scheme should be planned for the benefit of the farming community. The Chairman suggested that this matter should be left for a later Council meeting to discuss after the reorganisation of the Department of Agriculture, now in progress, had been completed. This was agreed to.

(b) *Scales of pay proposed by Protechnical Section P.S.A.*

The Secretary explained that in view of numerous protests by the Association and others against the scheme as originally suggested, it was assumed that the matter had been dropped. Recently, however, a letter had been received from the Chairman of the Protechnical Section in which it was stated that a certain scale of pay had been approved by the Protechnical Section P.S.A. as that to be aimed at. This scale was of such a nature that if applied to veterinarians they would stand to lose very little if anything.

It was agreed that a letter be written to the Chairman. Protechnical Section P.S.A. indicating that we could not agree to the proposed scale especially as efforts were at present being made departmentally to improve the present conditions of pay for veterinarians in the service.

(c) *Scale of charges for veterinarians.*

The Secretary said that the Status Committee had not yet met and nothing had been done in the matter. It was agreed to leave this matter to a later Council Meeting.

(d) *Publication of the proceedings of the Veterinary Board.*

The Secretary said that he had received a reply from the chairman of the board in this connection in which it was agreed that a resumé of the proceedings, omitting matters of a confidential nature, could be published annually.

(e) *Subsistence rates of Pay.*

The Secretary reported as follows: The Advisory Council P.S.A. had discussed the question at its conference in June 1935 and had received official intimation from the Public Service Commission to the effect that (i) it had been decided to abolish the flat rate of 7/6 a day for ordinary travelling in Rural Areas i.e. group B. would be deleted from Public Service Reg. 75 (1).

(ii) It had been decided with Treasury approval to increase the rate of subsistence allowance payable to District Travelling Officers in terms of P.S.Reg. 75 (4) from 7/6 a day to 10/- a day.

Mr. van Heerden expressed his satisfaction with this advance stating that he felt that the prospects of having the G.V.O. deproclaimed as D.T.O. were now much brighter and the matter could be handled by the Department.

It was agreed to leave the matter in the hands of the D.V.S.

Mr. van Heerden and the Secretary were detailed to draw up a resolution on this matter which would be brought up at the General Meeting.

(f) *Captain Clapham.*

Dr. du Toit stated that he had approached the Chief of the General Staff but that no progress had been made. In view of his dual position as D. V.S. and member of Council S.A.V.M.A. he did not feel himself suited to this task and asked to be relieved of it. Agreed. Dr. Thomas proposed that Drs. Curson and Quinlan should proceed further with the matter. This was agreed to.

(g) *Attendance at Council Meetings. Publication.*

The Secretary said that this had been left over from the last meeting and stated that it was proposed to tabulate the attendance of council members throughout the year for publication in the Journal.

After some discussion this was agreed to.

(h) *Members in arrears.*

The Secretary stated that letters had been written to the two members more than three years in arrears and asked whether Clause 7 (b) of the constitution should be applied. Mr. van Heerden volunteered to endeavour to collect the outstanding fees from one of the members. It was agreed that more information be obtained as to the whereabouts of the other member.

(i) *Supply of Akiron to veterinarians.*

The Secretary stated that in view of the last communication received from the manufacturers it was clear that the drug was to be supplied to veterinarians only.

(j) *Authorisation of veterinarians under Public Health Act.*

The Secretary said that this matter had arisen as a result of a complaint from a registered unqualified practitioner whose application for authorisation had been refused. Representations had been made by the council to the Veterinary Board and information had now been received to the effect that the member in question had been authorised.

(k) *Subcommittee to investigate revision of Constitution.*

The Secretary stated that this committee had not yet met and that nothing had been done. Dr. du Toit proposed that the matter be left in abeyance for the present and the subcommittee dissolved. Agreed.

(l) *Expert Witness Fees.*

The Secretary said that he had written to the Secretary for Justice about this matter and the latter had replied to the effect that expert witnesses received 15/9 per day if they resided up to 18 miles from the court or £1/1/- a day if they resided more than 18 miles from the court except medical expert witnesses, who received £1/10/- per day if they resided more than 18 miles from the court.

It was decided to refer the matter to the Status Committee.

3. **Reciprocity with the R.C.V.S.**

The Secretary read a letter from the High Commissioner for S.A. London to the Secretary for External Affairs S.A. in which the following points were noted: 1. Persons holding the B.V.Sc. of the University of Pretoria or S.A. can be enabled to practise without further examination in the non-selfgoverning colonies and protectorates and in the mandated territories administered by the Imperial Government. In return the Union Government would have to be prepared to allow any persons holding the M.R.C.V.S. to register and practise in the Union without further examination.

In certain cases where some legislation governing veterinary practice exists, the Secretary of State for the Colonies would be prepared to recommend to the Governors concerned that the University of Pretoria degree should be regarded as a qualification which should be recognised as entitling the holder, after payment of the registration fees prescribed by the legislation of the territory concerned, to practise veterinary medicine or surgery without further examination. Dr. du Toit stated that this matter would come before the Veterinary Board for consideration at its next meeting and that no further action by the S.A.V.M.A. was necessary.

4. **General.**

(a) *Encroachment of Government Veterinary Officers upon private practice.* This matter was discusser but it was felt that in view of the subcommittee's report it did not appear that there was sufficient evidence to indicate that state veterinary services encroached upon private practice.

(b) *Insurance.*

After long consideration it was agreed to accept the proposals of the S.A. Mutual Life Assurance Society which offered the most advantageous terms in a group insurance scheme for S.A.V.M.A. members. It was agreed to circularise members at a later date regarding the details of the scheme.

Minutes of 29th General Meeting, S.A.V.M.A., held at Onderstepoort, on the 12th and 13th September, 1935.

Present: Dr. H. H. Curson, Vice President (in the Chair). A. D. Thomas, M. H. V. Brown, C. Jackson, P. S. Snyman, G. McIntyre, J. Nicol, P. J. J. Fourie, D. G. Steyn, O. T. de Villiers, R. Alexander, W. J. Ryksen, G. C. van Drimmelen, J. Quin, E. M. Robinson, D. A. Lawrence, L. Stonier, W. J. B. Green, H. G. Franz, C. H. Flight, T. F. Adelaar, L. T. Edwards, P. J. Meara, W. G. Barnard, G. de Kock, A. M. Diesel, S. W. J. van Rensburg, L. L. Daly, A. E. Lund, C. J. van Heerden, S. T. Jackson, C. T. Nilsen, H. O. Mönnig, A. S. Canham, J. H. Mason, J. J. G. Keppel, R. Paine, W. D. Malherbe, N. T. van der Linde, M. Sterne, R. B. Osrin, A. Theiler, J. H. Cloete, H. P. Steyn, B. S. Parkin, H. Graf, J. H. N. Hobday, G. T. Henderson, E. C. S. Dawe, J. G. Williams, S. T. A. Amos, J. G. Bekker, J. H. R. Bisschop, W. S. B. Clapham, P. J. du Toit, R. du Toit, G. G. Kind, J. B. Quinlan, J. R. Scheuber, N. C. Starke, J. Walker.

The Chairman in a short address of welcome to the visiting members expressed his pleasure at the large attendance and his appreciation on behalf of the members for the facilities extended by the Director of Veterinary Services (and the Division) in allowing the meetings to be held annually at Onderstepoort and also the generosity of the Division in making possible the attendances of so many members of the field staff.

1. **Confirmation of minutes of the 28th General Meeting held at the Agricultural Showgrounds, Johannesburg, on 18th April, 1935.**

These minutes, having been published in the Journal, were taken as read and confirmed.

2. **Matters arising out of these minutes.**

(a) *Dr. Schulz.*

The Secretary stated that Dr. Schulz had come to a satisfactory arrangement with the Department and that he was now overseas receiving special treatment.

(a) *S. and T. Rates for G.V.O'S.*

The Secretary reported as follows:

The Advisory Council P.S.A. had discussed the question at its conference in June 1935 and had received official intimation from the Public Service Commission to the effect that:

i. it had been decided to abolish the flat rate of 7/6 a day for ordinary travelling in rural areas i.e. group B. would be deleted from P.S. Reg 75(1);

ii. it had been decided with Treasury Approval to increase the rate of subsistence allowance payable to District Travelling Officers in terms of P.S. Reg. 75(4) from 7/6 a day to 10/- a day.

3. **Election of new Members.**

The following new members were nominated by the Secretary, seconded by Dr. Curson, and declared duly elected:
Messrs. J. G. Boswell, J. J. v. d. Westhuizen and C. T. Nilsen.

4. **Motion by Mr. J. Nicol.**

" All existing office bearers shall be eligible for renomination at the termination of their period of office except the president who shall not be eligible for that office again until the following year but can accept any other office." Dr. Fourie seconded.

The motion was put to the vote and was lost by a large majority.

5. **Motion by Mr. P. S. Snyman.**

" That the Autumn General Meeting at the Johannesburg show be held on the Saturday after Good Friday in preference to the Thursday before Good Friday." Seconded by Dr. Fourie.
The motion was put to the vote and was carried by 16 votes to 14.

6. **Statement on reciprocity with R.C.V.S.**

The Secretary read a letter from the High Commissioner for S.A. London to the Secretary for External Affairs S.A. in which the following points were noted: 1. Persons holding the B.V.Sc. of the University of Pretoria or S.A. can be enabled to practise without further examination in the non-selfgoverning colonies and protectorates and in the mandated territories administered by the Imperial Government. In return the Union Government would have to be

prepared to allow any persons holding the M.R.C.V.S. to register and practise in the Union without further examination.

2. In certain cases where some legislation governing veterinary practice exists, the Secretary of State for the Colonies would be prepared to recommend to the Governors concerned that the University of Pretoria degree should be regarded as a qualification which should be recognised as entitling the holder, after payment of the registration fees prescribed by the legislation of the territory concerned, to practise veterinary medicine or surgery without further examination.

7. **General.**

(a) Dr. de Kock pointed out that several S.A.V.M.A. members would be attending the S.A. Medical Association Conference in Grahamstown this year and that he hoped it would be possible to arrange for members of the Medical Association to contribute to our next scientific meeting..

The President now handed over the chair to Dr. du Toit who opened the scientific section of the proceedings with an address in which he reviewed the present position regarding veterinary administration in the Union and the more recent advances in the fields of research and the control of animal diseases.

The following papers were read and demonstrations given :—

Oesophagostomiasis by Dr. H. O. Mönnig.

The diagnosis of Tuberculosis with Special Reference to the caudal fold test (single inoculation and the use of synthetic tuberculin), by Mr. W. J. B. Green.

Tuberculosis and daily practice by Dr. R. E. Hartig.

The Indigenous breeds of cattle and sheep of Africa by Dr. H. H. Curson and Mr. A. E. Lund.

Demonstration : The examination of the reproductive organs of cattle by Dr. J. B. Quinlan.

In the evening a lantern lecture on the osteodystrophic diseases of the domesticated animals was given by Sir Arnold Theiler.

Horsesickness immunisation by Dr. R. A. Alexander.

Foot and Mouth Disease in Southern Rhodesia by Mr. D. A. Lawrence.

The problem of tick eradication by Messrs. A. M. Diesel and J. Nicol.

Demonstrations : Bone diseases in horses by Sir Arnold Theiler. The tuberculin test by Mr. W. J. B. Green. Bowel fistulae and anastomoses in sheep by Dr. J. I. Quin.

A great deal of discussion followed the reading of these papers and considerable interest was shown in the demonstrations.

At the conclusion of the meeting the following resolutions were put to the meeting :—

1. *Resolution by Dr. Hartig* : Moved by Mr. de Villiers. Some discussion took place, but after the position had been explained by Dr. du Toit this resolution met with no support and was consequently not voted upon.

2. *By Dr. J. G. Bekker and seconded by Dr. G. G. Kind.*

   " This meeting of the South African Veterinary Medical Association, realizing the extremely serious position existing within the Union in regard to the incidence of tuberculosis amongst our cattle population, desires to impress upon the Departments of Public Health and of Agriculture the urgent necessity for insisting upon an effective national scheme against this scourge."

   Carried unanimously.

3. *By the Secretary and seconded by the vice-president.*

   " That this meeting of the South African Veterinary Medical Association feels that, as Government Veterinary Officers are the only group of civil servants, who as a profession, are classed as District Travelling Officers, representations should be made to the Secretary for Agriculture for their reclassification especially in view of the fact that even the proposed increase of the rate of subsistence applicable to district travelling officers is not considered reimbursive to officers whose duties are principally of an administrative nature."

The meeting then terminated with votes of thanks to the Department of Agriculture for allowing the meeting to take place and the facilities extended to the members of the field staff, the officers of Onderstepoort and their wives for hospitality extended to the visiting delegates.

BOOK REVIEWS.

Mediese Woordeboek [1] (Medical Dictionary: English-Afrikaans only).

This dictionary is a welcome addition to Afrikaans scientific terminology, as well as a useful aid for the translator and is, in its own sphere, a good complement to the Scientific and Technical Dictionary—

(1) *Mediese Woordeboek* (met inbegrip van Veeartsenykunde, Tandheelkundige en Hospitaal-benaminge) by F. v. d. Merwe and J. D. Louw, vi + 388 pp. Nasionale Pers, Bep., Capetown, Bloemfontein and Pretoria, 1935.

" Vakwoordeboek " of Malherbe (1932), which is not complete on the subject of medical terms. Yet it is notable that, in several instances in which a comparison was made, the book of Malherbe was found to be more complete even on medical terms than the book under review, and is certainly much more so with regard to purely veterinary terms. For these reasons it is a pity that the dictionary of Malherbe does not figure in the list of dictionaries consulted by the authors, according to their preface. The names of common surgical conditions in horses such as poll-evil, spavin, splint, ringbone, windgalls are conspicuous by their absence.

The statement of the authors that they do not subscribe to the idea that the spelling of a scientific word needs to indicate its derivation, may be disappointing to some who hold a different view. The authors have, however, hesitated to go to the extreme, since they give " (lymphocyt) " next to " limfosiet " and " (myelocyt) " next to " miëlosiet," apparently realising that the **-siet** of " limfosiet " is not comparable to the **-siet** of " parasiet."

There are several misstatements and incongruencies which are unfortunate:—" mite " is correctly translated by " myt," but " acarid " is given as " mietsoort "—" miet " should be reserved for a haystack. " Aphosphorosis " is translated by " stywesiekte," " oesophagostomiasis " by " knoppiesderm," " congested " by " geswel," " platyhelminth " by " lintwurmsoort," all of which may be partly true but are not scientifically correct. " Succinic-acid " translated as " sukkinesuur " is a poor choice, the correct word being " barnsteensuur." Mention is made of a " cirrhotic kidney " which should be a " fibrotic kidney." " Domsiekte " is given for " coenurus infection " but is quite a different condition.

The spelling is in certain cases quite unacceptable and is a good example of pursuing phonetic and even unphonetic puritanism in spelling to its bitter end, e.g. " kirrose," " kokkidiose," " kokkidium," " osteomalakie." Since " Ancylostoma " and " ancylostomiasis " have found international acceptance it is a pity to revert to older spellings. " Anatoxinë," " coelenterom," " Rhipicephalon," " langwurmsoort " and " echinoceal cyst " are probably misprints.

H. O. M.

The Physiology of Domestic Animals [2]

The 1935 revised edition of this book by Prof. Dukes, covering some 643 pages marks a distinct advance on the previous lithoprinted editions. It is well bound and of good print. The various organ sys-

[2] *The physiology of domestic animals.* H. H. Dukes, D.V.M., M.S., Comstock Puplishing Company, Inc., Ithaca, New York, 1935, pp. 643 and ill. Price 6 dollars.

tems are dealt with in eleven chapters, the first of which dealing with the circulating fluids of the body being written by Dr. E. A. Hewitt, while that on reproduction has been brought up to date in collaboration with Dr. G. M. McNutt. The book is well illustrated with a good number of drawings, graphs and photographs. A useful and welcome feature at the end of each chapter is the long list of references which also has been brought up to date. The conventional sequence of the chapters has been slightly altered in that the neuro-muscular system is only dealt with towards the end.

Special emphasis is laid on digestion and reproduction.

On the whole the book is very well written and has to be regarded as a distinct advance on the older works in Veterinary Physiology ; a subject which in the past has received all too scanty consideration from the Veterinary profession. By this work Dr. Dukes has stimulated interest in the subject of Animal Physiology and to both the Veterinary students and Veterinarians whether in practice or engaged in research work, this book can be strongly recommended.

J.I.Q.

Absorption Spectra in the Study of Vitamins and Hormones (3)

In this volume covering some 70 pages Dr. Morton discusses at great length the value of spectral analyses in differentiating between the various vitamins. In the first chapter Steenbock's work on Vitamin D is dealt with while in Chapter 6, the work of Szent Györgi in connection with the isolation and crystallisation of Vitamin C is clearly represented. In the last chapter the application of spectral analysis to hormone research work is briefly considered. This publication is especially useful to those research workers engaged in vitamin and hormone studies.

J.I.Q.

Thompson's Elementary Veterinary Science (4)

This work is well designed for the use of Agricultural students, farmers and stock-keepers generally. The book presents the subject in non technical language and is well illustrated. In teaching Veterinary

(3) *The Application of Absorption Spectra to the study of Vitamins and Hormones* by R. A. Morton, D.Sc., Ph. D., F.I.C. Adam Hilger, Ltd., Kings Road, Camden Town, London, N.W. 1.

(4) Fifth Edition. Revised by A. C. Duncan, F.R.C.V.S., B.Sc., pp. 8 & 465. Publishers Messrs. Balliere, Tindall and Cox, London. 10/6.

Science to Agricultural students there is always difficulty in giving the kind and character of veterinary education, which will produce expert stockmen and not quack veterinarians. There is also the difficulty of covering without a suitable text book a satisfactory amount of ground, and many students do not take notes well. This book will do much to lessen the labour of teachers in this sphere.

The book is divided into 15 chapters supplemented by an exhaustive index. The general anatomy and functions of each particular part of the body are briefly reviewed followed by a description of the symptoms and first aid treatment of the ailments common to the part. No information is given, however, on the diseases of exclusive significance to South Africa and the book is thus of less value in South Africa.

The importance of the horse's foot has not been overlooked, and a complete chapter is devoted to the anatomy and shoeing thereof. A short chapter on poultry disease has been added, but as the author states in the preface this is merely an introduction to the subject. Only a few diseases are described, even fowl typhoid being omitted. An extension of this chapter in a subsequent edition will no doubt add much to the value of the book.

Thirty-six pages are devoted to parturition difficulties, which are well illustrated by many diagrams and considerable attention has also been given to the methods of administering medicines and methods of controlling animals.

O. T. de V.

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