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JOURNAL OF THE SOUTH AFRICAN VETERINARY ASSOCIATION

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INTRODUCTION **BEKENDSTELLING**

OUR NEW PRESIDENT: RHODERICK IAN COUBROUGH

Rhoderick Ian Coubrough, "Bruff" to colleagues and friends, was born in Johannesburg on 16th February, 1938, educated at St John's College, Johannesburg where he matriculated at the end of 1956. He started his university career at the University of Natal, Pietermaritzburg, and continued it at Onderstepoort, where he graduated at the end of 1961. From December, 1961 until July, 1962 he worked as locum tenens before proceeding to the Ontario Veterinary College, Guelph, Canada, on a Rotary Foundation Fellowship, to undertake post-graduate studies. He was awarded the M.V.Sc. degree by the University of Toronto in June, 1964, his thesis being on the testicular histopathology and cytology of infertile bulls. He was assisted financially also by a Fellowship from the Ontario Association of Artificial Breeders and by a Borden Award for Research in Diseases of Cattle. Upon his return from Canada he spent a further 4 months as locum tenens, then took up an appointment as Lecturer in the Department of Genesiology in the Faculty of Veterinary Science at the University of Pretoria. In 1968 he was promoted to Senior Lecturer but resigned in 1970 to become the Head of the Section Reproduction at the Veterinary Research Institute, Onderstepoort. His love for teaching lured him back to the faculty and since the beginning of 1975 he has occupied the post of Senior Lecturer in the Department of Anatomy, teaching Histology and Embryology to B.V.Sc. II and Dip. Cur. Anim. students, as well as a post-graduate course to M.Med.Vet. and Dip.Med.Vet. candidates.

During July, 1976, he delivered the Captain R.S. de Quincey Memorial Lecture at the VIIth World Hereford Conference at Banff, Canada, and took the opportunity to visit various veterinary and medical schools in Canada, England and Denmark. He also visited the Harvard Medical School in Boston, where he attended a workshop on advanced techniques in reproductive physiology. From May 1 to May 5, 1978, he attended and presented a poster display at the International Symposium on Spermatozoa held at Woods Hole, Massachusetts, at the invitation of Dr Don W. Fawcett of the Harvard Medical School. On his return trip he visited Copenhagen, for discussions with Dr E. Blom on spermatozoon ultrastructure and with Dr H. Pedersen on techniques in examining spermatozoa, as well as the Veterinary School at Zürich, Switzerland.

His research interests include spermatogenesis, sperm structure, semen physiology and preservation, the mechanism of ovulation in cattle and the influence of nutrition on the bovine endometrium. He is presently engaged in work on comparative morphology and physiology of normal and induced parturition in cattle for his D.V.Sc. thesis. He is the author or co-author of 21 papers, has been responsible for six poster displays at various conferences and symposia and has delivered some forty papers and speeches at national and international meetings, more than half of these organised by the South African Veterinary Association or one of its Branches or Groups.

He has been a member of the Association since 1960, a Council Member since 1970, and Vice-President for the last two years. He has served on the Executive Committee, the Finance Committee, the Education Committee and is Chairman of the Public Relations Committee. He is Honorary Life Member of the Witwatersrand Branch of the Association, having served as Vice-Chairman in 1967 and 1968, and as Chairman in 1969. He was Honorary Secretary of the Reproduction and Production Group of the Association from 1966 until 1968 and its Chairman from 1977 onwards. He is a member of the Equine Practioners Group, of the Northern Transvaal Branch of the Association and represents the SAVA on the Liaison Committee for Professional Societies concerned with Agriculture. He was Chairman of the Programme Committee of the Biennial Congress held in Grahamstown in 1977 and of the 75th Anniversary Celebrations in 1978. Besides these activities on behalf of the Association, he has also been a member of the Veterinary Board since 1972; in addition he is a member of the following learned societies Anatomical Society of Southern Africa, Electron Microscopic Society, Fertility Society, Society of Animal Production and the Biological Society. Of the alumni associations, he is a member of the Old Johanniar Association, the Alumni Association of the University of Toronto, life member of the 'Bond van Oudstudente of the University of Pretoria, and, on the social side belongs to the Pretoria Country Club.

He married Pauline Hesse on October 7, 1972; they have two sons, aged four and two.

Quite apart from his scientific achievements and his services to the Association, it is Bruff's innate courtesy sagacity, his carefully considered opinions, that have won him the esteem of his colleagues, expressed by his unanimous election as President of the South African Veterinary Association at the Annual General Meeting of 1978 and his investiture on the occasion of the Gala Dinner celebrating the Association's seventy-fifth anniversary.

SAVA ANNIVERSARY 75 BESTAANSVIERING SAVV

To mark the 75th Anniversary of the South African Veterinary Association, the celebrations catered for both cerebral and gastric needs, with a broad spectrum continuing education program, a look into the future, a gala dinner, and culminated in the first multidisciplinary symposium organised by the SAVA – the Mastitis symposium – reported on elsewhere in this issue (page 292).

On Tuesday 8th August various workshops, demonstrations and discussion groups were arranged by several Groups of the SAVA (Wildlife Group, Clinicians Group, Poultry Group, Reproduction Group, State Veterinary Group), in conjunction with Faculty Departments (Medicine, Surgery, Pathology, Genesiology), and the Veterinary Research Institute (Depts of Pathology, Toxicology, Protozoology, Reproduction: Research and Field Services). The program catered for a diversification of interests, highlighting topical matters, new knowledge, and advanced methods and techniques. To single out but a few topics for this extremely successful day mention is made of embryo transfer in cattle, autoimmune disease, spinal surgery, the electron microscope as a diagnostic aid in pathology, current advances in toxicology, and the use of the blow pipe in game capture. The day was a great success, most informative and enjoyed and valued to the full by an overwhelming attendance. The hard work of those who presented the programs was well rewarded and to all of them go our most sincere thanks.

The AGM of the Association was held on the morning of August 9th in the magnificent Conference Centre of the CSIR. During the AGM messages of congratulations were read out, including one from our Honorary President, Mr P.M.K. le Roux. After the business of the meeting had been completed, the ladies of the National Veterinary Wives Association joined the meeting. A message of good wishes from the International Veterinary Wives Association was read out by Mrs Brenda Hofmeyr, President of the S.A. Veterinary Wives Association. The morning culminated in the presentation of two Boswell Awards, one to Dr G.D. Sutton and the other to Dr C.B. Rippon. The afternoon session was devoted to a symposium on the future of Veterinary Education, Veterinary Services, Veterinary Practice, and the Veterinary Profession in general. The papers read are recorded elsewhere (see below) but all those present agree that the afternoon was most worthwhile, stimulating and thought provoking for veterinarian and non-veterinarian alike. The dignity and respect for the profession in the eyes of the outsider can only have been enchanced. To the speakers, who put so much time and thought into their presentations, go the warm thanks of your colleagues.

Perhaps the focal point of the celebrations was the one intended to be just that – the Gala Dinner. This was a truly splendid and glittering occasion held in the Pretoria City Hall on the evening of Wednesday 9th of August. The City Hall itself looked a picture in candle-lit regal splendor, with the tables adorned by Proteas especially flown up from the Cape for the occasion. The atmosphere was most convivial while retaining a relaxed dignity befitting an honourable profession. The dinner was attended by colleagues from all corners of the country, by dignitaries from associated and allied professions and societies, past presidents of our Association, and many other friends of our profession. Dr P. Koornhof as guest speaker provided a lustre to this festive function. During the evening the SAVA's highest award, a gold medal was presented to Dr E.M. Robinson, and the evening terminated with the induction of the new president. The occasion was one that was most memorable, is still talked about in glowing terms, and made one proud to be a veterinarian. To the executive of the Northern Transvaal Branch of the SAVA, on whose shoulders the organisation of the dinner fell, go all the laurels. They did not spare themselves in making this evening the success it was, even to the smallest detail. Your tremendous efforts are greatly appreciated, and the sincerest thanks of the SAVA go to you.

ADDRESS **TOESPRAAK**

SAVA ANNIVERSARY 75 BESTAANSVIERING SAVV

TOEKOMSBLIK OP VETERINÊRE ONDERWYS*

C.F.B. HOFMEYR†

ABSTRACT: Hofmeyr C.F.B. **Views on the future of veterinary education.** *Journal of the South African Veterinary Association* (1978) **49** No. 4, 267-270 (Afr En) Dean, Faculty of Veterinary Science, University of Pretoria, P.O. Box 12580, 0110 Onderstepoort, Rep. of South Africa.

In briefly reviewing the history of veterinary education, particularly that in England, the enduring influence education has on the achievements and status of the profession is emphasised. The sound influence of the first teachers in South Africa, under the guidance of men like Theiler and subsequently du Toit, on veterinary education is outlined. The changes that have taken place in the face of altered demands, from that required by a predominantly State-employed profession to one consisting mainly of private practitioners but with ever-expanding fields of activity, necessitates continual attention to thorough teaching in the basic subjects, to the discipline as against the species approach – the latter being of value, however, when applying preventive medicine to herds/flocks, to a uniform undergraduate curriculum, and to foreseeing and providing adequate, specialised post-graduate education. The present under-graduate course has been extended from five to five-and-a-half years and the South African student enrolment to 90/a. Furthermore, more time will be found by already starting the teaching of Anatomy in the first year, thus providing for a final year of "student-internship". A completely newly planned faculty complex at a more favourable site is a necessity; clinical assistants will have to be employed. More attention must be given to Public Health and Food Hygiene. Facilities for training Black students is a first priority in providing for additional student enrolment. Despite all modern teaching aids, the teacher must always play a vital key rôle.

"Every investigation that can be made as regards those duties for which an orator should be held responsible, I bid you, make.
And what are those duties? To discern events in their beginnings, to foresee what is coming, and to forwarn others" – Demosthenes.

Dit is deel van my opdrag vandag – om in die toekoms te sien – maar die lot van die profeet is veelal onbenydenswaardig. Dit word vertel dat 'n biskop 'n klein teologiese kollege in Amerika besoek het. Na ete verklaar hy dat die duisendjarige ryk op hande is, aangesien alles reeds ontdek is. Die president van die kollege het beswaar gemaak en verklaar o.a. dat mense binne 50 jaar soos voëls sal vlieg. Vererg roep die biskop uit: "onmoontlik, om te vlieg is slegs vir die engele". Sy naam? Wright, die vader van Orville en Wilbur Wright, pioniers van lugvaart!

Laat ons dan, soos Demothenes beveel het, teruggaan in die geskiedenis. Arnold Theiler was die eerste dekaan van ons fakulteit, wat in 1920 ontstaan het met 'n vyfjarige kursus en akademies deel van die Transvaalse Universiteitskollege, vanaf 1933 die Universiteit van Pretoria.

Dit was gelukkig dat die fakulteit volgens algemene europese tradisie dadelik universiteitsgebonde was, en nie 'n veeartsenyskool nie, en dat die kursus vyf jaar geduur het – ongewoon lank vir die tyd – met 'n besonder deeglike wetenskaplike grondslag, vanselfsprekend vanweë Theiler se inslag as navorser.

By wyse van kontras kan aangedui word wat in Engeland plaasgevind het. Die eerste veeartsenyskool het in Londen in 1792 ontstaan met Charles Vial de Sainbel, 'n gegradueerde van Lyons se Veeartsenyskool en junior professor te Alfort, as eerste professor. Die kursus was drie jaar en slegs intelligente studente is gekeur. John Hunter, chirurg van mediese faam, was 'n kragtige ondersteuner van die Skool. Ongelukkig en katastrofies is Sainbel in 1793 aan droes oorlede en John Hunter 'n paar maande later. Edward Coleman, 'n mediese chirurg wat nie deur Hunter geag was nie, het dit reggekry om Sainbel op te volg. Hy was uiters onbekwaam, het die kursus na nege maande verkort en was nie keiskeuring met sy opname van studente nie. Ongelukkig het hy in 1839 eers gesterf en is opgevolg deur 'n beskermling, William Sewell, wat op dieselfde wyse voorgegaan het. D.M. Campbell, redakteur van "Veterinary Medicine" skryf in 1934 in 'n artikel "Development of Veterinary Medicine in North America" die volgende:

> "Veterinary Medicine in this country occupies a position subordinated below what its importance merits, or what its very material achievement justifies... The causes for this unfortunate condition probably do not lie wholly within its development on this continent, but in some measure extend back to the genesis of veterinary science in England nearly a century ago..."

Hierdie opmerkings toon duidelik wat 'n belangrike en langdurige invloed opleiding op die verloop van 'n professie het. Dit maan tot uiterste versigtigheid om slegs deurdagte veranderings in opleiding aan te bring.

Die opleiding onder dekane Sir Arnold Theiler en professor P.J. du Toit was dan ook onmiskenbaar gerig tot die behoeftes van navorsing en veeartsenyvelddiens, aangesien die Staat die veterinêre horison tot die einde van die dertigerjare gevul het. Inderdaad is in die vroeë dertigerjare 'n omsendbrief aan alle universiteite deur die dekaan/direkteur gestuur om voornemende veterinêre studente te ontmoedig, aangesien die Staat geensins aanstelling na afstudering in die Staatsdiens kon waarborg nie.

In die vroeë veertigerjare het modern-ingestelde privaatpraktyk begin ontwikkel. Dit sou 'n ingrypende effek op die professie in al sy aktiwiteite hê. Geleidelik het die professie begin waarneem hoeveel meer hy, in

*Toespraak gelewer tydens die 75-jarige bestaansviering van die Suid-Afrikaanse Veterinêre Vereniging, Pretoria, op 9 Augustus 1978.

†Dekaan, Fakulteit Veeartsenykunde, Universiteit van Pretoria.

landsbelang, sy horison kan verbreed. Die groei van privaatpraktyk het in momentum toegeneem en die veeartsenykundige navorsing en velddiens se personeel het gevaarlik verminder. Opleidingsgeriewe vir meer studente is genoodsaak. Nuwe fakulteitsgeboue is in 1955 op eie kampus betrek. Verder het privaatpraktyk meer kliniese opleidingsgeriewe genoodsaak, sowel as die oopstelling van die fakulteit se poste vir aansoeke uit die private sektor, waar die dosente voorheen slegs (met een uitsondering) personeel van die navorsingsinstituut was. So het in 1958 privaatpraktisyns en andere uit die privaatsektor tot die doserende personeel toegetree.

Die 30 studente wat vanaf 1955 per jaar toegelaat is, is in 1963 tot 45 vermeerder, toe dit blyk dat 30 nog onvoldoende was. Die groei van privaatpraktyk het 'n terugwerkende invloed op opleiding gehad sodat benewens daarstelling van geriewe die leerplan ook die nodige aanpassing met betrekking tot klinieke en lesings moes ondergaan.

Met die groter wordende getal jong veeartse wat in praktyk en dus buite die Staatsdiens 'n bestaan gevind het, was daar 'n insypeling na ander professionele velde waarvoor die veearts gekwalifiseer was maar wat hy aanvanklik weens klein getalle nie kon betree nie, soos professionele en wetenskaplike adviseurs in die farmaseutiese en veevoer-industrieë, dosente in mediese, tandheelkundige, landboukundige en natuurwetenskaplike fakulteite, sowel as navorsers in soortgelyke navorsingsinrigtings, aanstellings in natuurbewaring, groter aandeel in voedselkeuring en volksgesondheid, en veterinêre adviseurs vir intensiewe of industriële boerderystelsels, soos bv. die pluimvee- en varkindustrie, beesvoersentrums ensovoorts.

Dit is 'n fundamentele oorweging dat die beplanning van opleiding die behoeftes van die professie in al sy vertakkinge in ag moet neem: 'n formidabele taak, die beplanning waarvan buite die vermoë is van enigeen wat nie intiem bekend is met die onderskeie behoeftes nie. Aangesien daar onvermydelik 'n tydperk van 'n paar jaar verloop tussen aanpassing van opleiding en die uitwerking daarvan, moet, waar moontlik, toekomstige behoeftes antisipeer word. Dit is dikwels nie moontlik nie, maar 'n voorbeeld van waar dit wel gebeur het, is die instelling van die M MedVet-grade in 1963. Hiersonder sou die huidige beplande wetgewing vir die instelling van 'n spesialisteregister sinneloos gewees het.

Vir die veterinêre opvoedkundige is die woorde van Julius Caesar (63 v.C.) 'n voordurende vermaning: "Neem ag hoe jou huidige verordeninge die nageslag mag beïnvloed." Indien 'n fout met die onderwysbeplanning gemaak word, al word dit spoedig geïdentifiseer, mag die herstel daarvan jare neem, veral as gevestigde belange in die tussentyd ontwikkel het. Aangesien dit onrealisties is om opleiding te beplan sonder dat die toekoms in ag geneem word, is dit noodsaaklik dat hier 'n mate van toekomssiening van die professie ingevleg moet word.

Uit die buiteland, veral uit 'n sekere land, en selfs hier in die Republiek van Suid-Afrika kom die geroep om opleiding meer prakties te oriënteer (dus minder teoreties of fundamenteel). Ek verwys veral na die basiese vakke. Dit is 'n gevaarlike gedagterigting wat op die lewering van onwetenskaplike gegradueerdes met oppervlakkige kennis kan uitloop. Ons moet aanhou om in die stigtingstradisie van hierdie fakultiet te volhard, ten einde te voldoen aan die behoeftes van wydverspreide wetenskaplike en navorsingsaktiwiteite. Die kursus dek 'n wyer spektrum van rigtings as enige ander natuurwetenskaplike kursus, met die gevolg dat die jong veearts 'n dienooreenkomstige wye keuse binne sy professie het: 'n buitengewone geleentheid vir selfverwesenliking en 'n baie groot landsbate. Daar word verwag dat meer veeartse tot die akademie in verskillende universiteite as dosente sal toetree, o.a. veral in Fisiologie, Anatomie, Farmakologie, Diereproduksie, Kliniese of Chemiese Patologie, Eksperimentele Chirurgie ensomeer.

Die professie speel nog nie die rol op die gebied van Voedselhigiëne en Volksgesondheid wat hy op wetenskaplike gebied *kan* en in landsbelang *moet* speel nie. 'n Belangrike faktor is die tekort aan veeartse. Dit sal egter binne enige jare nie meer die rede wees nie. Daar is 'n sterk saak uit te maak om Melkhigiëne onder die Onderafdeling Vleishigiëne, Afdeling Veeartsenydiens in te skakel. Dit sal moontlik al manier wees om op 'n nasionaal-gekoördineerde wyse die mastitisprobleem aan te pak. Daar word oorweeg om gedurende die studente-internjaar reg aan die toepassing van Voedselhigiëne en Volksgesondheid te gee.

With regard to the socalled species approach, there seems to be a misconception. It is logical having teaching members of the same discipline tracing the diagnosis and treatment of the same pathological process in the various species. This preserves a great boon of veterinary studies, viz. obtaining deep insight by studying the same disease process in different species. In the clinics this faculty maintains and will continue to maintain a discipline approach. Envy of this arrangement has often been expressed to me by veterinary educators on both sides of the Atlantic in cases where clinics are organised according to species and change is impossible because of vested interests.

An unfortunate byproduct of the species approach in the clinical field is the introduction of elective courses particularly in a certain country. This idea has developed to such an extent that there are even demands that anatomy should provide for a choice of species. Besides endless complications regarding the application of professional legislation, the strength of our profession is that *all* veterinarians basically hold the same qualification. In any case, how many students can forecast their professional career accurately? At a symposium on veterinary education in Thessaloniki, Greece, on occasion of the 20th World Veterinary Congress, in 1975, I opposed the principle of elective courses. I was almost overwhelmed by the strong agreement literally voiced by veterinary educators, from the Scandinavian countries to South America.

Let me quote Macaulay (17 April 1933): "Let us open to them every career in which ability and energy can be displayed."

Species approach on the basis of the herd or flock is an entirely different concept, and is tied to preventive medicine. This is not only justifiable, it is eminently desirable in those species kept not so much as individuals but as a herd or flock. The discipline clinical specialist is available to treat valuable individual animals suffering from ailments within his specialty. The species specialist deals with the animal group as a unit, as the individuals are usually of relatively small value. He concentrates on preventive medicine and group problems.

For many years the faculty has treated poultry in this

fashion. Only a year or two ago Pig Diseases and Sheep Diseases have been introduced to apply enunciated ideas to the species mentioned. In collaboration with the Meat Board a Senior Lecturer (Associate Professor) has been appointed to teach pig diseases, to take charge of the pig improvement scheme and of the veterinarians appointed full-time under this scheme. It is hoped that something similar will be accomplished with sheep diseases. Consideration is given to cattle in the same context. From the beginning of next year the University is introducing two new M MedVet degrees to cater for specialists in poultry and pig diseases respectively.

One change that has been introduced is that all veterinary students henceforth have to attend the University of Pretoria from the first year, as Anatomy is to be introduced already in that year. This change is very important, because it gives more room for subjects which presently have insufficient time, e.g. Infectious Diseases. The bilingual tradition, however is, maintained.

The full flowering of our veterinary education will only occur when we have moved to a new site and to a completely newly planned faculty. Of necessity introduction of various new ideas is limited by facilities planned originally for 30 students per class and extended on a temporary basis to accommodate classes of 90 plus students. The present situation is unfavourable for the acquisition of the required clinical material. The position will deteriorate with increased local urban developments and because of direct competition with the projected veterinary faculty of the Medical University of Southern Africa.

To enlarge the present faculty on a permanent basis would cost only R2 to R3 million less than building a completely new faculty, the enlarged complex, however, will never be a properly functioning unit. A new faculty, therefore, is essential but the cost will not be less than R20 million. These figures are according to authoritative estimates after in depth investigation.

Because of distance between farms, the area providing large animal clinical material will have to have a radius of about 100 km, in contrast to the state of affairs in Europe, where the distance is about 15 to 20 km. As first priority this necessitates the placing of the faculty close to main arterial roads radiating in different directions. There is a suitable area East of Pretoria. The creation of a so-called field station, as has been suggested, is no solution. The faculty, no matter where it is placed, will have to accept all species for treatment and will require all clinical facilities. The same applies to the field station, which will have to be placed at least 200 km from the faculty in order to avoid overlap. Besides the clinical departments, Pathology, Infectious Diseases and Parasitology will have to be accommodated adequately, as it would be too far away from the main faculty for to and fro movement of staff, students and animals. Students will have to have a hostel, sports fields and such amenities. With veterinary education falling in the most expensive group of faculties, this scheme will push up the cost so high as probably severely to limit staff and sophisticated equipment, to mention only one of the problems.

The need to co-ordinate the large number of courses in the curriculum has been realized for a long time, as has the necessity of widening the outlook of students and bringing them into closer contact with rural veterinary medicine. This has found expression in lengthening the course to 5½ years, the last two semesters forming a student-intern year, free from formal lectures. There will be opportunity for these students to spend more time in clinics under less regimented conditions. Members of the teaching staff will not shelve their responsibilities during the student-intern year, but will be able to give more informal, personal guidance under more practical conditions. This will be in accord with the dictum of Sir William Osler, famed medical educator of early this century, which still holds true:

> "An academical system without the personal influence of teachers upon pupils, is an Arctic winter; it will create an ice-bound, petrified, cast-iron University and nothing else... To teach the current knowledge of the subject he professes – sifting, analysing, assorting, laying down principles. To propagate, i.e. to multiply facts on which to base principles – experimenting, searching, testing."

There is an impression amongst some veterinarians and students that given notes, slides, video tapes, with a sound track and such-like educational aids, the ends of educations are fully served. Nothing is further from the truth. The professor or lecturer is indispensible and the extreme demands made on him should not be underestimated. According to the lecturers themselves, it takes three to five years for a good practitioner to become a fully competent lecturer in a clinical department.

Some reference has been made to post-graduate education. No faculty anywhere in any discipline can produce graduates who are fully mature and competent unless the course is extended to an unrealistic number of years. Under-graduate education is complicated by the tremendous growth of knowledge in all disciplines. This makes post-graduate education all the more imperative. That the profession is fully aware of this is indicated by the 115 post-graduate candidates registered in our faculty. Specialist studies are well catered for by the M MedVet-degrees. To this I shall return later. The post-graduate Dip MedVet, soon, it is anticipated, to become a BVSc(Hons), occupies a unique place and has been hailed by many progressive practitioners.

Under present arrangements, few post-graduates can undertake full-time studies, with the result that the study period is doubled or tripled. To overcome this disadvantage, a system of clinical assistantships is essential. This is impossible to obtain under present circumstances. The problems might be overcome if, in a new faculty, the three hospitals, one for each clinical department, can be combined into a large hospital, having its own administration and run as a going concern, employing clinical assistants as hospital staff under supervision of the relevant clinical departments. The clinical assistants would be M MedVet candidates. Such hospital organisation is one of the changes which must be investigated when the new faculty is built.

When considering the training of additional veterinarians, the first priority is veterinary education for Blacks. Attempts are being made to speed up this process.

Regarding the 90 students per class at present, many veterinarians have fears that we are heading for overproduction. It is a fact that there are very few, if any, country places open where a practitioner can make a living. Even in the cities many practitioners maintain that practice is slackening. Rural practice, however, will grow if veterinary hospitals can be established so that farmers can avoid travelling fees by bringing in their

large animals, unless herd problems have to be investigated. If the State can have a direct or indirect hand in establishing such hospitals, together with delegation of some more State work to practitioners, rural private practice will have a new lease of life. As one rural practitioner recently remarked to me: "T.B. testing is a real stabilising influence and a boon to country practice." The State should promote the rôle of the veterinarian in preventive medicine – the most important area of rural veterinary service – as actively as possible. If these ideas come to fruition, the feared overproduction of veterinarians will not eventuate. If the *need* for veterinarians and not the *openings* is the criterion, there would be a shortage of veterinarians for many years to come.

It must be gathered from what has been stated that veterinary education is alive to its responsibilities in this respect. The State should give full recognition to postgraduate degrees in terms of promotion and salaries and should encourage such studies by appropriate means. For most of the exacting branches of veterinary endeavour the BVSc should be regarded as an interlude on the way to further degrees. Each and every teacher must reconcile himself with the words of Keats in "Hyperion":

"So on our heels a fresh perfection treads
born of us
And fated to excel us."

If our students start where we have started, they will most likely end where we have ended. But if they stand on our shoulders, that is when progress is made.

ADDRESS **TOESPRAAK**

SAVA ANNIVERSARY 75 BESTAANSVIERING SAVV

THE FUTURE OF VETERINARY SERVICES IN THE REPUBLIC OF SOUTH AFRICA*

B. C. JANSEN†

ABSTRACT: Jansen B.C. **The future of Veterinary Services in the Republic of South Africa.** *Journal of the South African Veterinary Association* (1978) **49** 271–273 (En) Chief Director of Animal Science, Private Bag X116, 0001 Pretoria, Rep. of South Africa.

Future developments will depend mainly on new information generated by research and on effective application of preventive medicine. In the latter case, the various diagnostic centres in South Africa will have to be developed to their full extent, leading to the drawing up of computerised disease profiles and monitoring of the incidence of scheduled diseases. Dealing with these problems will require further knowledge to be generated by research.

Problems of increasing drug, insecticide and acaricide resistance and problems of virus bionomics will call for attack at the molecular, biochemical, biophysical and immunological levels. This will demand adjustment of post-graduate veterinary education and of ever closer collaboration with scientists well-versed in the basic disciplines.

Despite the argument that animal production will be ousted by crop production, the former, particularly in South Africa, is bound to develop and will call for more attention to the physiology of digestion and metabolism and to diseases of metabolism of ruminants.

Concern is expressed that so few young veterinarians take up research as a career, as South Africa has many veterinary problems peculiar to itself.

To attempt to look into the future and predict the subsequent course of veterinary services is a challenge to the discernment of one who has been involved in veterinary research and the life sciences for over three decades. The accomplishments and general trend of science, which have maintained a steady growth rate in this period and have virtually encompassed several scientific eras, enable one, however, to make a reasonable prediction for the future. Since most of the currently available knowledge has already found its application in veterinary science, future developments will have to depend on new information generated by research. In view, therefore, of the vital rôle to be played by research, it seems appropriate to analyse its prospects more closely.

Some thirty years ago our knowledge of biological processes in health and disease was rather elementary. Diseases had then to be treated symptomatically with limited therapeutic measures, and preventive vaccines were limited to a few disease conditions. Diseases such as East Coast fever and foot-and-mouth disease were controlled by a stamping-out policy. In the course of time our knowledge of the causes of diseases increased, and vaccines and therapeutic agents became so readily available that the Divison of Veterinary Field Services was able to apply a rational approach to most of the former epizootic diseases. As a result, several of these diseases have already been eradicated and large-scale campaigns are currently being conducted against brucellosis and tuberculosis. The time necessary for their eradication will depend on the availability of funds and suitable manpower, but the stage will arrive when the country will be free of these and similar diseases, and then the main responsibility will be to guard against their re-introduction.

*Address delivered at the 75th Anniversary of the South African Veterinary Association, Pretoria, August 9, 1978.
†Chief Director of Animal Science.

For a long time to come, however, diseases caused by bacteria, protozoa, and viruses, nutritional and metabolic derangements and erosive diseases in the wider sense of the term will still be with us. The economy of animal production will dictate that these diseases be prevented rather than controlled. Since the cost of labour, transport and drugs will to a large extent preclude the treatment of individual clinical cases, the emphasis will have to be placed increasingly on preventive medicine.

Effective schemes for disease prevention can be based only on epidemiological studies and it seems that in the South African situation the diagnostic laboratories at the various centres will have to be developed to their full extent. They can then serve as nuclei for epidemiological studies on a national scale, not only for the state veterinary service, but also for private practitioners. Thus, statistical data will be assembled, which could be transformed into disease profiles by computerisation and serve as a basis for future decision making. A fully developed diagnostic laboratory service will provide the mechanism for monitoring the incidence of scheduled diseases throughout the country.

The Division of Veterinary Services, however, is impeded from the effective performance of its functions by a lack of knowledge on certain problems, e.g. the control of scrapie; the resistance of ticks to acaricides; insufficient protection against diseases such as foot-and-mouth disease by currently available vaccines. These problems depend for their solution on further fundamental research.

Veterinary research has already made phenomenal progress and will undoubtedly continue in this way.

In the field of protozoology, the life cycle and mode of transmission of most parasites have been worked out and through research in collaboration with the pharmaceutical industry highly effective synthetic insecticides, acaricides, and drugs against protozoal parasites have been developed. These have brought incalculable ad-

vantages to the control of animal diseases, but, unfortunately, insects and ticks have developed a resistance against many of these substances, while resistance against some of the most modern drugs has emerged among protozoa, e.g. the resistance of trypanosomes against phenanthridinium compounds and *Eimeria tenella* against glycarbylamide. These phenomena foreshadow rather serious consequences for the future. Being related to incompletely known factors, they will only be elucidated by fundamental research in biochemistry and genetics. There is no doubt that the investigation of biological methods of insect control and the use of insect hormones will have to be accelerated to make us less dependent on insecticides for the control of insect-borne diseases.

A golden age started for antibacterial chemotherapy when Domagk introduced prontosil in 1935. Since then a large number of active sulphonamide compounds have been synthesized in a search for drugs with increased antibacterial power or range, increased solubility, decreased toxicity or with altered rates of absorption and excretion.

In 1940 Florey and his colleagues re-investigated the properties of penicillin, first described by Fleming in 1929, and developed it into a powerful chemotherapeutic substance for the treatment of human and animal bacterial infections. This was the beginning of the production of a large variety of antibacterial substances from moulds and actinomyces; even to this day new products in this series are being discovered. These agents have made a vast difference in the control of animal diseases and are even used as growth stimulants. During the course of their use, however, the serious problem of resistance to antibacterial substances emerged, with severe clinical and epidemiological consequences. This resistance has a genetic and enzymic basis and a solution to the problem will only be arrived at through advanced biochemical and genetic research.

A new phase of activity began in the study of viruses in relation to disease when Theiler in 1930 showed that yellow fever virus was pathogenic by the intracerebral route in mice. The history of research on viruses and virus diseases from this period onwards became essentially a history of the development of new technical methods and of the emergence of new concepts as the implications of the technical discoveries were realised. This resulted in inactivated and live attenuated virus vaccines which are of inestimable value in the control of human and animal virus diseases. But many problems still remain in the field of virology. Some viruses display a multiplicity of strains which differ antigenically. The influenza viruses, for example, are capable of forming recombinants with a mixture of the characteristics of the parent strains but antigenically sufficiently different to be able to give rise to new epidemics. The same type of phenomenon may be responsible for the practical problems experienced with the control of bluetongue in sheep. The essential nature of incomplete viruses and their relationship to helper viruses is not completely known yet, with the result that the cause of diseases such as pulmonary adenomatosis and various forms of cancer still needs elucidation. The so-called slow viruses are still enigmatical.

It seems that effective chemotherapy against virus diseases will become a reality, but much more research is required in this field.

On account of the essentially extensive farming system that will continue to be practised in South Africa prevention of diseases will always play a more important rôle than chemotherapy. The production of a wide range of veterinary vaccines and continued research on their improvement will remain a very important activity.

The challenging problems enumerated above and many similar ones can only be solved by fundamental research at the subcellular or molecular level, involving biochemical, biophysical, and immunological techniques.

Fortunately, since about 1940, a wide circle of investigators have been attracted into the field of molecular biology and they have applied a variety of refined physical, radiochemical and genetic techniques to the problem of virus multiplication within the cell. A new epoch in biological research dawned with the discovery of the structure of DNA in 1953 and since then the scientific knowledge about fundamental biological processes has increased exponentially. This revolution continues and there is no doubt that in future those viruses which have so far resisted the application of standard methods will yield to studies at the molecular level.

Somewhat analogous to the situation in molecular biology, the science of immunology is at present in a phase of ascendancy. It has accumulated a sufficiently large, ordered and consistent mass of facts to challenge chemists, biochemists, geneticists and other fundamental scientists to carry their techniques into this field. This will lead to a better understanding of the body's defence cells and to a more rational approach to the control of diseases by means of vaccines. The possibility of the manufacture of synthetic antigens to stimulate a wide spectrum of immunity with fewer injections than are given at present, should not be lost sight of.

Veterinarians have already established themselves in biomedical research and this tendency will increase in future as animal models are progressively used for research on human diseases.

From a consideration of the requirements of future veterinary research, as illustrated by a few examples, it is clear that scientists trained in basic disciplines such as biochemistry, biophysics and immunology will play an ever-increasing rôle. It will be incumbent on the veterinarian to collaborate very closely with such scientists and translate their findings into feasible methods of disease control and animal production.

Post-graduate veterinary education will have to be adjusted to equip veterinarians for co-operation on an interdisciplinary level with scientists trained in basic disciplines. Owing to the diversification of veterinary science it is no longer sufficient for a veterinarian to be only clinically orientated.

When on one hand due regard is given to the important function of research for the future, and on the other hand to the increasing demands to be made on animal production, both intensive and extensive, one cannot help being concerned about the fact that so few young veterinarians take up research as a career. South Africa has many veterinary problems peculiar to itself and their solution will depend on local research.

The prospects of increasing food supplies from plants are in many ways brighter than those from domestic animals: plants yield more kJ/ha than do animals. Some policy makers have therefore been prompted to assert that animal production will become a diminishing and

ultimately an insignificant component in agriculture and will be ousted by crop production. Their conclusion has been arrived at by arguments such as: animal products are not an essential component of the human diet; energy-producing foods will be the limiting factor in a hungry, over-populated world and not protein; grain can be used directly by man; and animals are not an essential component of agro-ecosystems.

On the other hand, convincing arguments can be advanced to prove that animal production will always remain a source of food for man. Animal production offers a means of utilizing natural resources that cannot be used in any other way. For example, animals can graze on land not fit for human habitation or crop production; they play a vital rôle in utilizing crop residues, failure crops and waste products; pasture grazing maintains soil structure and the organic content of soil; and man is unlikely to abandon his preference for meat and dairy products.

In a country such as South Africa, where a deficit of concentrates for livestock feeding is bound to develop in future, an increased contribution to food production will have to be made by meat-producing ruminants grazing the vast stretches of submarginal land available to us and of which the primary products are not directly convertible into food by man. But the physiology, digestion, metabolism, and metabolic diseases of ruminants on natural grazing lands will need much more attention from the veterinary profession in South Africa in future in order to develop our potential for increasing livestock production.

If the research requirements of our country can be met, there is no reason why the next 75 years of veterinary activity will not be as exciting and productive as the same period in the past.

ADDRESS **TOESPRAAK**

SAVA ANNIVERSARY 75 BESTAANSVIERING SAVV

THE FUTURE OF VETERINARY PRACTICE IN SOUTH AFRICA*

B.H. PAPPIN†

ABSTRACT: Pappin B.H. **The future of veterinary practice in South Africa.** *Journal of the South African Veterinary Association* (1978) **49** No. 4, 274–278 (En Afr) P.O. Box 4065, 1514 Germiston South, Rep. of South Africa.

Private practice in South Africa only really got under way about forty years ago; today more than 450 of the approximately 850 active veterinarians are manning the just over 300 practices, the majority involved in small animal practice, or in mixed practice with predominantly small animal work. The Zevenbergen study of 1973 indicated that the small animal practitioner works on an average 56,5 h/week with a nett income of only R4,66/h. The Institute of Man Power Research has shown that the income of self-employed veterinarians is the second lowest of the nine professions compared, but at the head of the list in the percentage increase over the last six years studied. Despite the economic recession and consequent cut-down on expansion, the small animal practitioner has fared better than some other professions; a definite swing from rural to urban practice is noticeable. The standard of urban and equine practice is high. The Voluntary Hospital Accreditation Scheme will bring further improvement over and above the minimum laid down by the Veterinary Board. The practice of inviting outstanding visiting lecturers to conduct short courses in various centres and the facilities created by the Veterinary Faculty are contributing to greater specialisation and sophistication but care must be taken to keep costs to clients within reasonable limits. In this respect the envisaged Pets' Medical Aid Scheme could prove a boon. The improved liaison with the animal welfare societies will assure that professional services will extend to the underprivileged.

The underlying reasons for the difficulties facing rural practice are enumerated. Active promotion of rural practice, which was yielding a nett income of only R3,78/man h five years ago is necessary. This can be achieved by continual emphasis on large animal work during undergraduate and by adequate post-graduate training, by funding overseas study tours for rural practitioners, by subsidising of rural large animal hospitals by the Land Bank, coöperative societies and farmers' societies, by making greater use of rural practitioners in rural meat inspection services and in disease eradication schemes which, together with compulsory vaccination projects, have to be extended. Auxiliary small animal work can contribute greatly to keep the rural practitioner going. The profession, the farming community and politicians must take serious note of the unbalanced ratio of rural to urban practitioners.

There is certainly a temptation to dwell at some length on the achievements of the past on an occasion such as this, but suffice to say that, where we are today, is due to the efforts of a few intrepid veterinarians who ventured into the unexplored land of veterinary practice about forty years ago, risking financial disaster and ignomy, but whose resourcefulness and perseverance triumphed. They built the foundation of the flourishing private practices we have today, where the veterinary practitioner is a highly respected member of the community, both in the country and in the cities, projecting the image of the profession in his daily contact with the public.

If I may then tarry a while in the present, draw upon my limited experience of the past, and dare to look into the future, I hope to do so with diffidence and in no presumptous manner. I trust my essay into the realm of crystal gazing will not be idle speculation, because this matter is of vital importance, not only to the practicing veterinarian, but perhaps even more so, to the undergraduate and to our clients, particularly the stock owner. Unfortunately, as you know, the vagaries of the economic climate in general and agricultural economics in particular, preclude any simple projection. It seems fairly definite from all the sources I have been able to tap, that there has been no growth in rural practices in recent years, nor is there likely to be in the future, which of course will be to the detriment of our livestock industry and thus to South Africa. I shall dwell upon the importance of this presently, but let us first look at some statistics.

Practices are categorised as either small animal, large animal (including specific equine practices) and mixed, the latter usually having a small animal bias. An in depth survey is at present being undertaken by the South African Veterinary Association into these categories and their requirements, and will also determine the size of the practices and whether they are urban or rural. In a survey undertaken for a memorandum issued by the Association in February, 1977, there were 176 veterinarians in small animal practice, 195 in mixed practice and only 57 (or about 15%) in large animal practice.

Discussing these figures recently with a leading wholesale veterinary chemist, I was told that he had noticed a swing to urban practice in his sales which used to be 50-50 and were now 60-40 in favour of small animal drugs, owing to the increase of small animal practitioners. He had also noted that, on average, a new small animal practice is established every month, that existing city practices were opening branches and that practice size was growing, up to two to four men practices. Zevenbergen[2] noted a few years ago that the total gross practice income in mixed practices was R 69 500, in small animal practices R 53 500 and in large animal practices only R37 700 despite the latter having the highest income from the sale of remedies. Again, the

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†Private practitioner and Past President of the South African Veterinary Association.

nett income per partner-hour in mixed and small animal practice was about R 4,60, but only R 3,78 in the case of large animal practitioners. No wonder, then, that the recently published figures of the Institute for Man Power Research of the South African Human Sciences Research Council[1] show that the income of self-employed veterinarians is second lowest out of nine professions, but it is encouraging to see that we are on top of the list in the percentage increase over the last six years. Thus we see an apparent swing away from rural practice with its lowest income to urban practice, where the incomes are higher and still rising. Unless something drastic is done, this tendency will continue in the future.

Equine practice in South Africa, according to visiting lecturers, is of a very high standard and the capital invested by equine practitioners in real estate and instrumentation is close behind the United States of America. The depression of the economy apparently has not affected the Thoroughbred industry, though the pleasure horse industry has indeed felt this chill wind. Nevertheless, there are many opportunities for the experienced equine practitioner in the future. He must know how to handle horses and know something of the jargon perculiar to horsemanship; he must be able, also, to devote a lot of his time to parasite control and to breeding problems associated with management, diet and to other non-clinical tasks. The equine practitioner of the future will practice from very sophisticated, species-orientated hospitals; besides attending to sick and injured horses, will also be involved in very delicate biochemical aberrations. Veterinary educators are taking an increasing interest in equine work but the aspirant equine practitioner must have a flair for horses, together with considerable practical experience.

Of the more than 450 veterinarians, out of a total of about 850 active veterinarians, practising out of just over 300 practices, the majority is involved in small animal practice and in mixed practices which do predominantly small animal work. The prosperity or otherwise of this sector must then have a profound effect on the whole profession, mainly from the point of view of employment opportunities. This will influence the manpower available for other sectors and thus the competitive salaries they will have to pay. In the past decade or so this branch of our profession has made tremendous strides. This is seen in the number of small animal practitioners, the excellence of our facilities, in the quality and expertise of our work and the depth of our clinical knowledge. But how is this sector faring financially in this time of economic recession and inflation, and what are the prospects for the future? There has been a levelling off in the case load and thus in the turnover; the income graphs show a tendency to flatten out rather than reach the peaks we have become accustomed to in our predictions. But there is no serious problem in small animal practice, nor is there likely to be. Our accountants confirm this: they say we seem to be less affected than some other professions and businesses in these relatively difficult times.

The practising veterinarian has a very long day – in fact the Zevenbergen analysis[2] arrived at a figure of 56,5 h/week – regarded as one of the most outstanding figures to emerge from this study, but the nett income per partner-hour was only R 4,66. It is therefore apparent that in quieter times the practitioner still has quite a full day and that there is ample room for improvement in practice management and better utilisation of time.

Many practices of late have been reluctant to increase their manpower and to embark on new building programmes or to improve their instrumentation, but should there be an upturn in the national economy – and financial experts say that this has already occurred – then the practitioner will not be able to cope with the increased load and many new employment opportunities will occur; then our extrapolation of a few years ago will be realised.

I have every confidence in the fundamental soundness of small animal practice. Indeed, and this is apparently a pattern seen in other countries as well, more practitioners turn to the cities in times of economic stress because of this stability.

Small animal practice owes its popularity to several factors. Firstly, the South African pet owner is becoming increasingly aware of the good service that is available in modern facilities and, in the average family, the companion animal, the child's pet and the watch dog play a big rôle and will be one of the last luxuries a hard-pressed wage earner will forego. Then, in South Africa, the practitioner is presented with a remarkably high, interesting and varied case load. A very wide range of modern preventive vaccines are utilised by the responsible pet owner, spaying and neutering are common operations, allergic diseases are prevalent and our free-roaming dogs and cats make sure we never have a deficiency of fight wounds and accident cases. The discerning dog owners and breeders are becoming more and more aware of our increasing expertise and, in their turn, becoming more knowledgeable. They expect, and are prepared to pay for, a very sophisticated service. All these tendencies will increase in the future.

While enthusiastically acquiring more knowledge and building better facilities to offer better services, we should always be aware that many clients are unable or unwilling to invest too much in their pets, no matter how great their sentimental value, and thus we must not price ourselves or our services out of their reach. Our clients too, are finding out that to keep more than one or two pets is becoming increasingly expensive with the rise in the cost of the purchase price, feeding, licences etc., and will have to restrict the number of pets kept.

The practitioner of the future, before embarking on a course of treatment that may be excellent for the patient but financially embarrassing to the owner, must fully discuss the monetary implications of any procedure that might appear to be too costly with the client. Thus the principle of quoting as accurately as possible will become more routine and in certain circumstances will become mandatory from an ethical point of view.

To overcome the problem of those who can't afford veterinary fees, two concepts should come more to the fore in the future. The first is a pets medical aid scheme or form of insurance, investigated by our Clinicians' Group and a firm of brokers, to be instituted under sponsorship of a petfood manufacturer backed by a reinsurance scheme. This, briefly, will provide insurance should the pet require more expensive therapy, at a premium of R 25,00/a, with an R 8,00 excess and a maximum of R150/a, paying 80% of all expenses other than elective vaccines and surgery. Secondly, we should all assist the animal welfare societies in their mammoth task in this country of providing help for the animals of our underprivileged people. Donations from the public and subsidies from the State and local authorities

should be earmarked by them to employ veterinarians to render assistance to those who need the companionship and protection of a dog or cat, but who are not able to afford veterinary fees, particularly our Black, Brown and Indian people. By such societies being firm in their almoning system and by not unfairly competing with the practising veterinarian, they will engender our goodwill and help; we shall be able to work in harmony and the animals of the poor will benefit even more.

With that look at the financial consideration for the future, I would like now to turn to two other important facets.

The first is the standards of our facilities. Over the past years the Veterinary Board has set certain standards for facilities wishing to be known as Hospitals, Clinics and Consulting Rooms, and the naming and recognition of same. It is now contemplating an inspectorate to ensure that premises meet these standards. The Clincians' Group is embarking on a new project of practice improvement in our Voluntary Hospital Accreditation Scheme. This will be over and above the statutory obligations and is based on the standards of the American Animal Hospitals Association and the British Animal Hospitals Association. It envisages a higher, yet realistic, level to which practices can aspire. The goal of this ambitious scheme, which could prove very costly to some practices, is to provide even better hospitals throughout South Africa, and should make a great impact on future practice. To name a few considerations: practice management will be improved by detailed records which will have to be kept of all the nursing care, the clinical pathological tests, X-rays and in the anaesthetic and surgical logs. Apart from a higher quality radiograph and laboratory service, there must be a library and dental service, and the aseptic operating suite must include anaesthetic machines, non-shadow lighting, and the theatre staff must be properly dressed in gowns, gloves, caps and masks.

The other aspect which will require even more logical planning and extension in the future is our continuing education policy. South Africa, through our Veterinary Association, was close on the heels of the U.S.A. as one of the pioneers in this field. Over the past eight years the small animal practitioner has been exposed to a galaxy of speakers from the U.S.A. and Britain and in many disciplines and specialities. We have had the greatest exponents of small animal medicine and surgery come to our country and, by means of short, intensive courses at different centres, have been brought completely up-to-date in our work. Over one hundred practitioners attended these courses, including colleagues from the Faculty, and returned home mentally invigorated and enthusiastic. Our speakers have been complimentary about our standards, full of praise for the overwhelming hospitality they received and, in turn, have given great help to South African practitioners touring and studying in their countries.

In the future, more and more of our practitioners will be travelling to Europe and the U.S.A. to attend continuing education courses, congresses and to work temporarily at famous institutions and universities. Indeed, no less than 40 are going to the International Congress of the World Veterinary Association in Moscow in 1979. Hopefully all will be enabled to attend; equally hopefully all will return, otherwise my statistics will have to be amended.

Our Faculty has been of tremendous help to us in making the post-graduate Master's degree, and more recently a Diploma in Veterinary Medicine available to practising veterinarians as part-time courses. Of necessity, only those veterinarians within reasonable proximity to Pretoria have been able to avail themselves of this marvellous opportunity, but the enthusiasm and enrolment for further academic degrees have been good. Hopefully, such opportunities will be extended to encompass other geographical areas in the future, as is presently done at the hospital at Vrede. Thus, within our circle clinicians, there is developing a group of men whose added expertise will attract referrals and thus the basis for a future corps of small animal specialists is being developed. The concept of specialisation is being explored and developed by the profession. Though the specialist may still have to practice within a general practice until such time as his speciality practice will attract enough referrals, there is a glimpse of the future here. The Faculty members too, apart from all their help with papers at Congresses and Mini-Congresses, are offering to give a week's course at Pretoria. This gathering momentum for continuing education, which is the life blood of our profession and our uniting bond, demands that something like a Chair of Continuing Education be established, or, if that is financially impossible, a co-ordinating planning body be brought into being.

Our young graduates are aware that their degrees are just a licence to a lifetime of learning and it is up to us to plan this well, so that the optimum use can be made of both local teachers and our overseas' guests. As Sir William Osler said of medical doctors as long ago as 1900: "If the licence to practice meant the completion of his Education, how sad it would be for the practitioner, how distressing to his patients".

The practices of the future must surely be multi-man practices, where three or four or more practitioners work together, each having expertise in a particular species or discipline. With the knowledge explosion and with the public expecting a higher degree of sophisticated medicine, the veterinarian, to get more satisfaction and to be able to render a better service, must narrow his interests and concentrate on one particular species, or discipline within that species. The day of the generalist alas, is, nearly over.

In larger practices this opportunity to develop expertise or specialise in a narrower field has made a terrific impact on practice and will continue to do so to an increasing extent in the future. For example, there are small animal clinicians concentrating on Ophthalmology, doing advanced eye surgery, or on Orthopaedics, doing spectacular spinal surgery, or on Endocrinology, unravelling the secrets of hormonal dysfunction. All this will lead to an even closer relationship with our colleagues in the medical field in a clinical and research context as well as in management and zoonoses.

In the practice of the future there will be two new persons, the South African trained veterinary nurse and the final semester student. Initially, the veterinary nurse will find it difficult to oust the in-service trained black or white assistant, but in time, their help, particularly as radiographer and in the laboratory, will be recognised and they will gradually assume their rightful place as an indispensable member of our hospital staffs. It might be advantageous for our aspirant nurses to do more of their practical training in approved and willing practices in their home towns to increase their chances

of finding employment on graduating.

The integration of the student also need some thought and planning to enable him to make the most of the immense potential there is for him to gain practical experience in our practices, both with regard to practice management and to clinical work. Over the years this Association has pleaded for more practical experience for our undergraduates, especially in large animal clinical medicine, and has suggested, that, because of the paucity of this material in the environs of Onderstepoort, a second faculty be established in a more intensive agricultural area, or, alternatively, that the existing Faculty established a clinical facility in a suitable country district. These were not acceptable to the authorities involved for reasons of finance and logistics. If we are to have the responsibility for part of this part of his training, and we welcome this challenge, then there should be consultation between us and the Faculty to know just what is expected of us, and how we best can fulfil our obligation. The practices that are involved should get full recognition from the University as training hospitals and a liaison body should be set up in which our constructive ideas may be heard. If we are to be the means by which the student will get a major portion of his large animal clinical experience, then our goodwill and co-operation are essential.

Before looking at the future of rural practice, a few slides of some South African equine and small animal practices will illustrate my points.

In teenstelling met die voorafgaande wil ek graag voortgaan met die kwessie van die toekoms van die plattelandse praktyk waar daar oënskynlik 'n verslapping ingetree het. Hier is duidelik 'n gebrek aanwesig teenoor die florerende kleindierpraktyk met sy groter toewyding en entoesiasme. Dit is 'n onrusbarende toestand, veral as 'n mens in ag neem dat daar bekwame jong graduandi van ons fakulteit afstudeer met die potensiaal om baie goeie plattelandse praktisyns uit te maak en sodoende 'n belangrike invloed op die landbouekonomie te kan hê. Weens hulle bekwaamheid en gesofistikeerde opleiding in moderne tegnieke is hierdie jong manne in staat om 'n nuwe dimensie in grootdierpraktyk in te lei. Dit word betreur dat sommige boerderygemeenskappe en gebiede nog onbewus is van hierdie bate en derhalwe nie daarvan gebruik maak nie. Hopelik sal pogings soos bv. die mastitis-simposium hierdie week my punt beklemtoon. Na my mening het dit noodsaaklik geword dat instansies soos bv. die SAVV of ge-organiseerde landbou in tydskrifte wat die boer bereik die veearts en sy diensbaarheid in die veesektor duidelik moet illustreer. Veeartse kan dit ook self in hulle plaaslike gemeenskappe doen, onderhewig aan die bepalings van die etiese kode of met spesiale toestemming van die Veeartsraad.

Op 'n meer positiewe trant wil ek graag erkenning gee aan die talle landbouorganisasies en kooperatiewe verenigings wat wel die belangrikheid van ons professie en sy dienste in hulle besondere industrie waardeer en dit derhalwe moontlik gemaak het, veral in die begin, vir 'n praktisyn om homself te vestig. Die veranderinge aan wetgewing op koöperasies gaan hierdie hulp vergemaklik en dit sal baie welkom wees. Selfs in hierdie moeilike ekonomiese tyd wat ons beleef is daar egter nog die plattelandse praktyk wat floreer met sy stabiele en goed ingeligte kliënte, sy betroubare veearts met sy goeie diens en doeltreffende bestuur. Vir die jong veearts egter wat 'n praktyk wil begin, is daar 'n gebrek aan aanmoediging en finansiele steun of aan kredietfasiliteite, selfs van erkende bronne soos farmaseutiese firmas.

Die boer is nog dikwels tradisioneel aangewese op sy eie en soms ondoeltreffende behandelingsmetodes, terwyl die behoefte aan moderne tegnieke en metodes deur kondisionering nog by hom tuisgebring moet word, met ander woorde, baie boere moet veeartsbewus gemaak word vir hulle eie gewin en voordeel. Derhalwe gaan baie gebiede nog geheel en al mank aan veeartsenykundige hulp en is daar geen vooruitgang in ander swak voorsiende gebiede nie.

Die plattelandse praktisyn van die toekoms sal nie net 'n klinikus moet wees nie, maar ook 'n deskundige op die gebied van epidemiologie, voorkomende geneeskunde, voortplantingsprobleme en plaasbestuur in die algemeen, asook globale kuddebenadering moet toepas. Dit word besef dat kliniese diagnostiek baie moeiliker by grootdiere is en daar dikwels van diagnostiese hulpmiddels gebruik gemaak moet word wat 'n probleem in die plattelandse praktyk kan wees. Terselfdertyd is daar nog etlike entiteite en kliniese werk op grootdiere waar dringende navorsing noodsaaklik is, bv. vrotpootjie, hartwater, agtergeblewe nageboortes, mastitis, kalwersiektes, ens. As die boer op eie houtjie enige van hierdie probleme probeer aanpak, is dit menslik onmoontlik om enige sukses te behaal behalwe deur die samewerking met die deskundige op hierdie gebied, nl. sy veearts, wat direkte toegang tot navorsingliteratuur en nuwere kennis het. Laasgenoemde sal geheel en al in sy spesiesbenadering betrokke moet raak en sodoende 'n entoesiastiese en kundige grootdierdeskundige word, wat met reg trots kan wees op sy bydrae tot die vooruitgang van georganiseerde landbou en sodoende tot sy landsekonomie. As hy egter nie oor die nodige agtergrond of kennis beskik nie, nie die nodige fasiliteite het nie, of in 'n oningeligte gemeenskap beland waar daar geen toegeneentheid bestaan nie, het hy geen keuse as om sy toevlug na die stedelike gebiede te neem om daar sy professionele strewe uit te leef nie. Ongelukkig kan omstandighede buite sy beheer, soos die ontvolking van die platteland, onvermoë van die boer om veeartsenykundige dienste te bekostig weens onstabiele landbouprodukteprysе, korttermynbemarkingsbeleide, kwotastelsels, ens., maak dat 'n veearts met al die goeie hoedanighede nog ten gronde gaan. Droogtes, swak gehalte vee, ekstensiewe landbougebiede met sy lang afstande bemoeilik sy saak nog verder.

Na aanleiding van al die probleme wat ek hier geskets het, is die vraag nou dit: Wat kan gedoen word om die posisie van die landelike praktisyn te verbeter?

1. Ons fakulteit moet voortgaan met al hulle huidige pogings om studente soveel as moontlik in grootdierwerk op te lei en selfs die laaste semester selektief te maak. Die klem op epidemiologie, voorkomende geneeskunde, die beheer van erosiesiektes en die boerderyekonomie moet voortgesit word.
2. Die fakulteit en die betrokke groepe binne die SAVV moet voorsiening maak vir nagraadse studie en voortgesette opleidingskursusse vir ons plattelandse praktisyns, soos wat reeds vir die kleindierpraktisyn bestaan. In dieselfde asem wil ek ook graag pleit vir geborgde oorsese besoeke van praktisyns om dan weer op hulle beurt hierdie nuwe idees en vooruitsigte na hulle kollegas tuis terug te bring.
3. Die subsidieëring van grootdierhospitale deur die

Landbank, koöperasies of boereverenigings. Die veelvuldige voordele vir die boer is voor-die-handliggend en word deur die besparing van reiskoste van die veearts beklemtoon. Op sy beurt kan die veearts beter diagnostiek en chirurgie beoefen, met beskikbare laboratoriumsfasiliteite en baie meer gevalle behartig, terwyl hy meer geredelik vir telefoonoproepe, voorligting, konsultasies en die uitreiking van voorskrifte vir middels beskikbaar is. Dit is reeds bewys dat hierdie grootdierhospitale slegs in sekere dele van ons land finansieël geregverdig is en dat die oprigting daarvan sorgvuldige beplanning vereis. Die logiese alternatief is die bakkie-praktyk in assosiasie met kleindierpraktyk. Hierdie hospitale sal nie net die gebruik van middels wettiglik kanaliseer nie, maar ook die doeltreffende gebruik van baie duur middels finansieël realisties maak. Etiese middels word aan die landboubedryf deur hierdie hospitale beskikbaar gestel bv. droëkoei-terapie, antibiotika, ens.

4. Landbou-Tegniese-Dienste kan die teringuitroeiingskema bevorder deur die dienste van praktisyns te gebruik en terselfdertyd landelike praktyke stabiliseer deur hulle fooie op 'n realistiese vlak te hou. Nie net sal die land deur teringvrye kuddes baat nie, maar hierdie geakkrediteerde kuddes sal tot baie meer stabiliteit en minder spekulasie lei veral in die digbevolkte beesgebiede rondom stede. Volgens die huidige beleid van die Melkraad (Witwatersrandgebied) sal premies op teringvrye vars melk vanaf 1980 betaal word.
5. Wanneer daar 'n verbeterde Brucellose-uitroeiingskema met kompensasie ingestel word, sal dit ook 'n verbetering aan die plattelandse praktyk meebring.
6. Die plattelandse praktisyn met sy unieke posisie in sy besondere omgewing is die aangewese persoon om afkeurings by sy plaaslike abattoir te doen.
7. Wanneer sal die dag aanbreek dat ons soos die buiteland, verpligte entingsprogramme vir beeste (soos die huidige reeds verpligte enting teen miltsiekte en Brucellose) sal hê, en hierdie entstowwe, soos kleindierentstowwe, net aan veeartse beskikbaar gestel sal word?
8. Nieteenstaande die spesiesbenadering en bekwaamheid van hierdie plattelandse praktisyn, is dit die bydrae van kleindierwerk wat, uit 'n finansiële oogpunt gesien, dikwels die pot aan die kook hou; inderdaad kan kleindierwerk 'n belangrike finansiële bydrae tot die stabiliteit van 'n gootdierhospitaal vorm.

Om op te som, wil dit vir my voorkom dat die huidige trant, met ons vrye ekonomiese onderneming, en indien daar geen daadwerklike hulp vir ons landelike praktisyns gaan kom nie, daar nog 'n groter swaai weg van die plattelandse praktyke na die beter besoldigde kleindierpraktyke van die stede gaan wees.

Vir die onthalwe van ons lewendehawebedryf in die besonder, en landbou in die algemeen, sal ons as professie, ons kliënte en boerderygemeenskappe, en ons politici, kennis moet neem van hierdie wandistribusie van praktisyns in Suid-Afrika en alles in ons vermoë moet doen om die saak met alle erns reg te stel.

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ADDRESS **TOESPRAAK**

SAVA ANNIVERSARY 75 BESTAANSVIERING SAVV

DIE TOEKOMS VAN DIE VETERINÊRE PROFESSIE*

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ABSTRACT: Schutte A. P. **The future of the veterinary profession.** *Journal of the South African Veterinary Association* (1978) **49** No. 4, 279-281 (Afr) State Veterinarian, Private Bag, 6500 Mossel Bay, Rep. of South Africa.

The veterinary profession in South Africa may be divided roughly into three main groups: the main body concerned with pet and equine practice; less than half that number primarily concerned with food- and fibre-producing animals, namely veterinarians in State Service and in rural practice; and the small minority concerned with education, research, industry and other services. Despite opinions to the contrary, the belief is expressed that this pattern does not represent the norm, that with some qualifications a shortage will still be experienced and that previous estimates of the man power requirements have been too low.

The South African Veterinary Association has concerned itself actively with the acute shortage in the past and student enrolment has increased to 30 in 1954; to 40 in 1962; to 45 in 1963 and to 90 in 1976. In spite of the Association's vigorous appeals for a second faculty, the Cabinet, in accordance with the Mönnig Report, has implemented an increase of facilities at the existing Faculty.

The present state of limited professional veterinary activity still represents an emergency situation. The Association, in a memorandum to the Minister for National Education in 1975, had estimated that the urban requirement for 1985 will be 1 000 veterinarians. Whether this estimate be too optimistic or too conservative, urban practice is bound to undergo the largest expansion.

The many handicaps notwithstanding, the animal industry must and will expand. The Association's estimates in its protracted negotiations with the Minister for Agriculture have been too conservative. Animal health services, specific disease eradication projects, diagnostic and extension services are all bound to increase. By 1985 the Veterinary Research Institute will require at least 100 veterinarians according to the Association's estimates. It is alarming that, during the past two years, of the approximately 80 graduates only one had joined the Institute, to resign shortly thereafter. The tremendous financial losses incurred from mastitis cannot be prevented by the handful of veterinarians presently concerned with control of the problem.

The increasing number of women veterinarians, although welcomed, necessitates the introduction of a greater factor of "service erosion" in any man power projection. The question is put whether veterinarians in future will be willing to put in such long hours as heretofore. All indications point to a greater need of veterinary man power. Although the growth may not be as linear as was projected, it will undoubtedly take place and the figures arrived at thus far may well prove to be on the conservative side.

Aan my is die eer opgedra om 'n mening te waag oor die toekoms van die veeartsprofessie. En dit direk nadat ons na die mening van kenners geluister het oor die toekoms van sekere groepe binne die professie. Hierop kan ek sekerlik nie verbeter nie, maar hoogstens 'n aanvullende bydrae lewer.

Die toekoms van die professie, waaroor ek 'n mening wil waag, het menigvuldige aftakkings of beroepverdelings binne sy geledere. Die groep waarna dr Pappin reeds verwys het, sal, as ons hulle almal bymekaar sou kry, hierdie saal net mooi vol sit. Hierdie is die groep veeartse wat primêr na die welvaart van ons troeteldiere en renperde omsien en ook, as die geleentheid hom voordoen, 'n deel bydra tot gesondheidsdienste van plaasvee.

Die veeartsprofessie sluit verder ook 'n groep in wat, as ons hulle by mekaar sou maak, kwalik die helfte van die saal sou volsit. Hier verwys ek na veeartse in owerheidsdiens en dié wat 'n landelike praktyk bedryf. Met ander woorde, dié groep wat primêr na voedsel- en veselproduserende diere moet omsien. Die groep waarvan verwag word om gesondsheidsdienste vir meer as 12 miljoen beeste, ruim 34 miljoen skape en bokke, 1,2 miljoen varke en 36 miljoen hoenders te lewer.

Hierbenewens moet ek 'n mening uitspreek oor die toekoms van diegene in die veeartsprofessie wat, as ons hulle bymekaar sou kry, slegs enkele rye van hierdie saal sou vul. En hier verwys ek na dié wat in die veterinêre onderwys, navorsing, aanvullende hulpdienste, die nywerheid en dies meer diens lewer.

Ek is pynlik bewus hoe moeilik dit is om 'n mening oor hierdie gebied uit te spreek. Maar ek het 'n onwrikbare geloof en vertroue in die veeartsprofessie. Daar is genoegsame bewyse van wat hierdie professie kon vermag en derhalwe kan ek nie anders as om met vertroue die toekoms in te gaan nie. Ek kan aanvaar dat daar diegene onder ons is wat bedenkinge oor die toekoms van die veeartsprofessie het en derhalwe 'n pleidooi lewer vir beperking op die getal studente wat jaarliks opgelei moet word. Ek kan ook geredelik aanvaar dat daar vandag veeartsenystudente is wat bekommerd moet wees oor die werksgeleenthede wat hierdie professie hulle bied. Maar ewe so aanvaar ek dat daar diegene in die veeartsprofessie is wat glo dat ons op 'n tekort aan veeartse afstuur en derhalwe 'n pleidooi lewer vir meer realistiese opleidingsfasiliteite. Dit is dan ook by laasgenoemde groep waar ek, met enkele kwalifiserende opmerkings, my wil skaar.

Die Suid-Afrikaanse Veterinêre Vereniging, die enigste liggaam wat veeartse uit alle vertakkings en werksvelde van die professie onder sy ledetal tel, is 'n liggaam waartoe 90% van die veeartse behoort en wat met reg as die mondstuk van die professie optree. Die

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Vereniging het veral gedurende die laaste 25 jaar hom baie nou en intiem met mannekragbehoeftes bemoei. So byvoorbeeld, in 1954, nadat die SAVV sekere tekortkomings omlyn het, is die getal studente wat vir veeartsenykundige opleiding toegelaat word van 20 tot 30 vermeerder en na verdere vertoë is die getal gedurende 1962 na 40 en gedurende 1963 na 45 opgeskruif, waar dit ruim 'n dekade vasgehak het.

Gedurende 1968 het hierdie Vereniging hom weereens genoodsaak gevoel om sy kommer oor die tekort aan veeartse uit te spreek en 'n pleidooi vir 'n tweede blanke fakulteit elders in die land gelewer. Gedurende 1969 word die Mönnig-verslag vrygestel wat, in teenstelling met die SAVV se mening, uitbreidings aan die reeds bestaande fakulteit aanbeveel, iets wat later as gevolg van 'n Kabinetsbesluit beslag gekry het. Sinds 1976 word 90 Suid-Afrikaanse inwonende studente per jaar tot die bestaande fakulteit toegelaat.

Dit is nodig dat ek eers terugverwys na die verlede alvorens ons die moontlikhede van die toekoms analiseer, want juis hierin lê die kern van die probleem opgesluit. Dink maar net aan vordering wat ons sou kon geboekstaaf het as daar reeds 10 jaar gelede gehoor gegee is aan die pleidooie t.o.v. die opleiding van 'n groter getal studente. Die situasie waarin die professie hom vandag bevind, en veral die samestelling van die verskillende werksvelde binne die professie, het nie uit nature so ontwikkel nie. Die situasie waarin ons verkeer is uit nood gebore, gebore uit 'n kroniese tekort aan toepaslik gekwalifiseerde veeartse. Veeartse het derhalwe net gebiede betree en probleme aangepak wat slegs deur 'n veearts verrig kan word. In soverre dit die boerderygemeenskap aangaan, het die praktisyn hom heeltemal tereg beperk tot die gebiede waar hy 'n menswaardige bestaan kon maak.

Laat my toe om die nogmaals te beklemtoon: die samestelling van die veeartsenykorps soos u dit vandag ken, moet sekerlik nie as die norm vir die toekoms gesien word nie. Daar sal drastiese aanpassing gemaak moet word. Ons lewe in veranderende tye en dit is slegs met die grootste omsigtigheid dat 'n mening oor die toekoms van die professie gehuldig kan word. U weet uit die Mönnig-verslag, wat maar enkele jare oud is, blyk dit dat ons teen die jaar 2 000 voedsel vir 39 miljoen siele sal moet voorsien. Huidiglik word 'n syfer van 50 miljoen as meer korrek aanvaar. Verder, daar word beweer dat die peil waarteen wetenskaplike kennis toeneem so snel geskied dat 90% van die kennis waarop die praktisyn vandag staatmaak, maar slegs 10 jaar oud is. As hierdie tempo gehandhaaf sou word, beteken dit dat die kennis van vandag slegs 10% sal uitmaak van dié wat oor 10 jaar benodig sal word om 'n veeartsenypraktyk sinvol te bedryf. Met hierdie oorwegings in gedagte, troos ek my daaraan dat waar ek my hier vandag op 'n moeilike terrein begewe, voorspellings t.o.v. die mannekragbehoeftes vir die veeartsprofessie in die verlede nog altyd hopeloos te konserwatief geblyk het.

Om terug te keer na die stedelike praktisyn. Die SAVV het reeds gedurende 1975 in sy memorandum aan die Minister van Nasionale Opvoeding daarop gewys dat gedurende 1985 ongeveer 1 000 veeartse benodig sal word om na die welvaart van diere in stedelike gebiede om te sien. Of hierdie skatting korrek of moontlik te konserwatief sal wees, hang af van faktore soos die tempo waarteen migrasie van die bevolking van die platteland na stedelike gebiede plaasvind; behuisingnood; die statuswaarde om sekere eksotiese troeteldiere, resiesperde en poloponies aan te hou; en natuurlik die diskresionêre inkomste van die stedeling, wat met die inflasiekoers gedurende die afgelope paar jaar noodwendig moes krimp, en ook tot watter mate die praktisyn toegelaat gaan word om van paraveterinêre hulpdienste gebruik te maak.

Vir my is dit egter heeltemal duidelik dat hierdie een vertakking van veeartsenydienslewering is wat die grootste uitbreiding gaan belewe. Die aanvraag na veeartse in stedelike gebiede gaan toeneem, nie net bloot a.g.v. die toename in troeteldiergetalle nie, maar hoofsaaklik a.g.v. die publiek se groter bewustheid van dieregesondheidsdiens wat duidelik na vore kom. Die stedeling is, in soverre dit sy diere aangaan, oënskynlik nie so eng aan die ekonomie gebonde as die veeboer nie. Hy is derhalwe in staat om op meer gesofistikeerde veeartsenykundige ingrypings aan te dring.

Sou ek my wend na die sektor wat primêr na die voedsel- en veselproduserende diere moet omsien, dan is ek ewe-eens optimisties. Let gerus op die enorme potensiaal wat ons veestapel beid. Ons moet net die geleentheid gegun word om hierdie potensiaal optimaal te benut. Let ook op na wat die boeregemeenskap reeds bereik het, 'n gemeenskap waarvoor ek te eniger tyd en enige plek in die wêreld voorspraak sal doen. Dit is so, dat in tye van oorskotte, gedurende tye wanneer sekere gedeeltes van ons land deur droogtes geteister word en gedurende tye van onrealistiese stygings in produksieen bemarkingskostes dit baie maklik gesê word dat die veeboer bankrotskap in die oë staar. Met my onderhandelinge met sy Edele die Minister van Landbou, mnr. Schoeman, oor die afgelope twee jaar, het dit nie juis dikwels gebeur dat ons oor die vordering wat t.o.v. veeartsenykunde gemaak is kon saam juig nie, maar ek kan dit nie meer met hom eens wees as dit oor sy vertroue in die boererygemeenskap gaan nie. Dit is so, dat, nieteenstaande die verhoogde skuldlaste en verlammende 11,4% inflasiekoers van verlede jaar, die boerderygemeenskap finansieel nog gesond is en daar geen rede is om boedel oor te gee nie.

Om die veebedryf, en meer spesifiek die plattelandse gebiede, van 'n ekonomies geregverdigde veeartsenydiens te voorsien, het die SAVV by wyse van memoranda en samesprekings met die Ministerie van Landbou besondere knelpunte en die kroniese tekorte aan veeartse uitgewys. En hier glo ek was ons voorspelling t.o.v. die toekomstige behoefte aan veeartse te konserwatief. Maar laat ek dit onmiddellik kwalifiseer deur baie duidelik te stel dat slegs met finansiële hulp van die Staat ons die nodige veeartse gevestig sal kry om die boer van 'n optimale diens te verseker. Ek is nie bereid om te aanvaar dat die owerheid:

1. nie gewillig is om die dieregesondheiddienste en siekte-uitroeiingsskemas uit te brei nie. Dit is langtermynprojekte, bv. net die Brucellose-beheerveldtog alleen kan 20 jaar in beslag neem; sulke dienste bied 'n geweldige moontlikheid vir die praktisyn om hom op die platteland te vestig. Die owerheid moet net die nodige belegging maak.
2. nie die nodige fondse sal bewillig om die Afdeling Veeartsenydiens te steun in sy pogings om regulatoriese dienste en veral hulp aan die Tuislande ten volle te laat ontplooi nie. Let wel, hier gaan dit nie net oor die wesenlike gevaar wat die indringing vanuit aangrensende gebiede van aansteeklike siektes soos varkpes, hondsdolheid en bek- en klousseer

nie, maar veel meer. Dit gaan oor die beheer van aanmeldbare- en erosiesiektes, voorligting en diagnostiese dienste. Dit gaan oor die bykans 150 siektes wat van die dier na die mens oorgedra kan word. Dit gaan oor 91 miljoen rand wat ons jaarliks aan veevrektes moet afstaan. Dit gaan oor die kroniese tekort aan Staatsveeartse. Dit gaan oor die magteloosheid om optimale diens te lewer met 'n bykans 30% tekort aan Staatsveeartse wat deur jare se agterstand in die hand gewerk is. Ek is nie bereid om te aanvaar dat die owerheid nie van die probleme bewus is nie.

3. nie die nodige uitbouing van die Navorsingsinstituut vir Veeartsenykunde sal kan bewerkstellig nie. Ons kan die toekoms met vertroue ingaan slegs as navorsing trend hou met die tye waarin ons lewe. Ons moes tot 'n groot mate die beskerming, wat geografiese isolasie aan die dierebevolking teen siekteverspreiding verleen het, inboet. Die intensifikasie wat plaasvind en dalk meer so die gemak waarmee groot getalle diere oor groot afstande verskuif word, bring op sigself probleme mee. Volgens die SAVV se beraming blyk dit dat ons teen die jaar 1985 ten minste 100 veeartse in verskillende spesialiteite aan die Navorsingsinstituut gaan benodig, maar hier is wesenlike probleme wat veral duidelik na vore kom as daarop gelet word dat van die ± 80 veeartse wat oor die laaste twee jaar aan die Fakulteit Veeartsenykunde afgestudeer het, net een by die Instituut se navorsingspan aangesluit het. Dié het enkele weke later besluit sy heil lê elders en is tans besig om hom as medikus te bekwaam. Dit gaan hier oor die onvermoë om die jong graduatus van 'n loopbaan in die navorsing te verseker.

4. om die professie te steun t.o.v. probleme waarmee die vleis-en suiwelprodusent te kampe het. Die professie het ook hier met wesenlike probleme te doen en die vraag kan tereg ook gevra word, watter kans het die veearts om die ontsettende verliese (heelwaarskynlik veel meer as die 67 miljoen rand) wat aan mastitis gekoppel word, te bekamp met slegs die enkelinge wat hulle hiermee bemoei? Ewe so met dienste en ondersoeke na die higiëne en geskiktheid van voedselprodukte van dierlike oorsprong wat vir menslike gebruik bestem is. Hier is ek bevrees moet daadwerklike verbeterings kom en die veearts sal sekerlik geken moet word in hierdie saak.

Die veearts het 'n regmatige plek om te vervul en net soos in ander lande sal mettertyd ter plaatse ook plek vir hom in die Departement van Gesondheid ingeruim moet word.

Graag wil ek dit beklemtoon dat weens sy unieke basiese opleiding wat die veearts ondergaan, hy in die gunstige bedingingsposisie geplaas word waar hy met gemak ook in verwante dissiplines diens kan lewer en selfs leiding kan gee. Hierin is wat my betref besondere moontlikhede vir die toekoms opgesluit. Gebiede soos marine-biologie, natuurbewaring, laboratoriumdienste en die industrie bied moontlikhede wat die grootste pessimiste onder ons tot ander denke sal bring. Maar die onus berus by die veearts om hierdie gebiede te ontgin en bewys te lewer dat hy hier tuis hoort.

Ten laaste wil ek my waag op die terrein van aktuele diensverliese of "diensperiode-afskilfering" en u aandag daarop vestig dat ons 'n tydperk sal binnegaan waar 20% en selfs meer van die veeartskorps uit vroulike veeartse sal bestaan. Hier moet u my nie verkeerd verstaan nie. Ek het niks teen die feit dat hulle hul op die veeartsenygebied begewe nie. Inteendeel, ek is dankbaar vir die puik dienste wat hulle lewer. Maar die feit bly staan dat die dienstydperk van vroulike veeartse slegs 25 tot 75% van dié van manlike veeartse uitmaak.

Verder wil ek u ook daarop attent maak dat met die beplanning van die behoeftes aan veeartse dit ewe-eens noodsaak is om die vraag te stel of veeartse in die jaar 1985 of selfs 2000 steeds bereid sal wees om die soms onmenslike lang ure wat sommige van u wat hier sit, van dag tot dag moes vermag, te handhaaf. Ek glo nie, selfs nie teen enige prys nie. Let maar gerus na wat in die mediese wêreld gebeur het. Derhalwe is dit logies dat hierdie aspek, sowel as die feminisasie-sindroom wat die professie ondergaan, in berekening gebring word.

Ek wil saamvat deur te beklemtoon dat die SAVV ruim vyf jaar gelede 'n omvattende ondersoek na mannekragbehoeftes van die veeartsprofessie geloods het en tot die slotsom geraak het dat ons op 'n tekort aan veeartse afstuur. Met die veranderende tye en probleme wat ons mee te kampe het, sal die behoefte dalk nie so liniêr toeneem as wat verwag is nie en is selfs 'n tydelike insinking moontlik. Sou daar egter met alle erns aan die knelpunte, soos uitgewys, gewerk kan word, bestaan daar by my geen twyfel dat die syfers, soos deur die SAVV beskikbaar gestel, aan die konserwatiewe kant is, om die minste te sê.

HISTORICAL **GESKIEDKUNDIG**

THE SOUTH AFRICAN VETERINARY ASSOCIATION: GLIMPSES FROM 75 YEARS OF SERVICE TO VETERINARY SCIENCE

R.I. COUBROUGH

ABSTRACT: Coubrough R.I. **The South African Veterinary Association: Glimpses from 75 years of service to veterinary science.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 283-286 (En) Faculty of Vet. Science, P.O. Box 12580, 0110 Onderstepoort, Rep. of South Africa.

The South African Veterinary Association originated with the formation of the Transvaal Veterinary Medical Association in 1903. The amalgamation of the three existing provincial associations under a joint constitution in 1920 formed a body representing the veterinary profession in the whole of South Africa.

Throughout the past 75 years the SAVA has served as representative for the diversity of interests of the profession. The aims and major contributions of the Association, past and present, as well as the challenges of the future, are outlined.

In the lifespan of any Association 75 years is a long time. It is a milestone of achievement in the history of a profession which has shown a dogged determination to acquire and maintain the dignity and status that become an honourable profession. For the high ideals to which the South African Veterinary Association was committed so many years ago have not altered in principle. We still aim to promote, improve, support and protect the interests and status of the veterinary profession. We still concern ourselves intimately with the laws that govern our professional activities, and advise and work with the relevant authorities to this end to ensure that these laws keep up with the demands of modern times. We have always had, and rightly so, a deep and sincere interest in the education and training of veterinarians, and all those others who constitute the members of the veterinary team. This is a right we will retain, for we have a decided vested interest in the product of this pedagogy. We are in manifold ways intimately involved, and thus the moulding of these young professional lives during their formative years is a responsibility from which we cannot divorce ourselves. Continuing education is an ongoing concern of ours as reflected in the congresses, symposia and short courses we arrange, and the journal which we publish.

We have committed ourselves to the promotion of our profession, both amongst our own ranks, as well as outside, by active extension work and public relations involvement. The aims and objects originally set out at the inception of our Association have thus in principle remained unchanged, but in withstanding the test of time have demonstrated the flexibility that has been necessary to adapt to the demands of a dynamic changing and growing profession in which the spectrum of veterinary activity has widened considerably to cover the highly diversified avenues of employment that are available to veterinarians today.

Our Association had its beginning in the formation of the Transvaal Veterinary Medical Association in 1903. Two years later in 1905, the Cape of Good Hope Veterinary Medical Society came into being, followed some time afterwards in 1909 by the Natal Veterinary Medical Association. There was always an excellent liaison and rapport between these three Associations who on several occasions attempted to persuade their veterinary colleagues in the Orange Free State to form an Association. This never came into being, however, because of the relatively few veterinarians present in the OFS at that time, most of whom joined the Transvaal Veterinary Medical Association.

One of the major issues concerning the profession in these early days was the protection of the status and professional interests of veterinarians in the absence of a Veterinary Surgeons Act in South Africa. Attempts had been made, within each Province before Union, and thereafter as a combined effort by all three Associations, virtually on an annual basis, to get a Veterinary Act passed through Parliament. For a time the veterinarians in Natal had been included in the Medical Ordinance related to medical practice, which afforded them this protection, but with subsequent amendment of this Ordinance this right was to pass, and they too joined the combined efforts of the Cape and Transvaal Associations.

The matter was brought to a head when an Ordinance of the Transvaal Administrator (No 259/1917) stated that "Veterinary Surgeon shall mean and include the Government Veterinary Surgeon, or Inspector of Stock in those towns where such an officer has been appointed, or if no such appointment has been made, the Magistrate". Forty five members of the Transvaal Veterinary Medical Association, led by Col. Irvine-Smith, protested in no uncertain manner against this Ordinance, with the immediate result that the Ordinance was repealed. It seems strange that all these years later, the shortage of veterinarians in the service of the State should necessitate the use of Stock Inspectors to do essentially veterinary work if the functions of the State service are to proceed, and that this principle should now be acceptable to the profession. Have we lost the zeal, interest and determination to fight for what is ours?

The implications of the 1917 Ordinance was the stimulus that was needed to bring the three Provincial Veterinary Associations together, in a concerted drive to get the Veterinary Surgeons Bill through Parliament. A pooling of funds was required to offset the expenses involved, as well as to whittle down strong agricultural opposition to the proposed bill. In 1919 the Transvaal Veterinary Medical Association took the major initia-

tive to revise its constitution to include the other Associations. Of the total of 95 veterinarians in Government Service and private practice in the Union of South Africa and neighbouring protectorates, 51 were members of the Transvaal Veterinary Medical Association. The inaugural meeting of the South African Veterinary Association took place on the 1st April 1920, and the new Association started with 79 (83%) members. At the time of the Association's Golden Jubilee the membership was 350, while this year our membership is close to 900.

The plea went out to Government to consult the Profession through its Association in all things concerning the Profession, and to take the Profession into its confidence. For in doing so there was everything to gain and nothing to lose. At the inaugural meeting considerable debate centred on the name of the Association, the South African Veterinary Association. Many felt that the word "Medical" should be included in the name, since its inclusion would increase the status of the Profession within the eyes of the public, as well as in the eyes of the Public Service Commission which addressed veterinarians as technical officers. For the first two years of the Association's lifespan this debate ran on, until in 1922 the name was changed to the South African Veterinary Medical Association. In 1971 the Profession felt it could once more stand on its own merits and the name of the Association was changed back to the South African Veterinary Association.

The question of the Veterinary Surgeons Bill remained a top priority of the new Association, and considerable effort was concentrated into promoting the bill. But year after year passed, and for one reason or another, and for one excuse and another, the bill was not enacted. Then in 1933 the great day arrived and the Veterinary Act No 16 of 1933 was passed through Parliament, and a major step in the recognition of the professional interests and status of the veterinarian had been realised. Some thirty years had elapsed since initial attempts in this regard had been set in motion. Now, 45 years and several amendments later, our Association is again involved in the updating and remodelling of the Veterinary Act of 1933.

In writing about the profession a year or two before the original Veterinary Act was passed Dr H.H. Curson quoted these lines from a poem by Henley:

"It matters not how strait the gait
How charged with punishments the scroll
I am the master of my fate
I am the captain of my soul."

These were lines that struck him as significant after the long and hard struggle coupled with the frustrations incurred in attempting to have the Veterinary Act passed. These were the lines which evoked the indictment that there had at times been a lack of enthusiasm, an absence of initiative. There had even been a suggestion of timidity in this regard on the part of senior members and leaders of the profession to put the case forcefully enough and with the necessary courage of conviction. He inferred that every member of the Association should make the affairs of the South African Veterinary Association a very personal matter. That we each and everyone of us have a binding duty and a commitment to the Association, and that in the interests of the progress of our profession we must be prepared to carry out that duty to the full, on committees, on Council, or just as active members who participate and lend encouragement to the endeavours of our Association. As these sentiments had significance then, even so do they apply now.

In 1922 the opinion was expressed that the under evaluation of Scientific Veterinary work which existed amongst the Administrative Officers of the Public Service was most unfortunate, for it was leading to a deterioration in efficiency which was reflected in the agricultural industry generally. As early as 1924 a diversity of avenues of veterinary employment was recognised, and it was stated that veterinarians were not merely healers of animals. Preventive medicine in these early days took on the form of disease prevention. The immense problems of eradication and control of rampant diseases like rinderpest, pleuropneumonia, nagana and East Coast Fever, were tackled with a great determination and devotion to duty which has never really received full recognition. While it seems that the handicap of our small numbers and the continued limitations on the resources made available to us to do what should be done in the interests of the animal industry are a repetition of our professions history, as a profession we can look back on the achievements of the past 75 years with some considerable degree of pride. The significance of the successes becomes even greater when we consider that the majority of conditions that have been brought under control were peculiar to the African continent, and thus our predecessors did not have the advantage of following techniques and methods applied elsewhere. They had to use their own ingenuity, initiative, resources and professional competence and experience to devise appropriate ways to combat and control each new disease and problem. The preventive medicine techniques of yesteryear used in the control of infectious diseases and the problems encountered with the numerous toxic plants found throughout the country, have of necessity changed with the passage of time: farming methods have changed to meet the demands of production; intensification of production methods has led to a greater animal concentration with concomitant problems. Infertility; calfhood diseases; mastitis; erosion by diseases like Tuberculosis and Brucellosis, despite stout efforts by all involved, still remain to be brought to heel.

The changing ratio of veterinarians in State service to those in private practice started to alter dramatically shortly after the war, and by 1955 was 190:160. While there has been no significant upward change in the number of State Veterinarians, the numbers of veterinarians employed in the many diversified fields of the private sector has increased manifoldly. As early as 1917 the plea went out for the use of private practitioners to augment the static or dwindling numbers of State Veterinarians, so representatations in this respect today are nothing new. Resistence to this move may have become tradition; for surely the interests of that which is veterinary, and is now in danger of slipping into lay hands, can be protected by building on the positive sides of this augmentation rather than blocking with the negative.

Remuneration of veterinarians has always been a factor of great concern to the Association. The salaries offered in lecturing, municipal and State service posts have never been in keeping with the standing and dignity of our profession. Since 1957 when a locum was offered as little as R6 per day, the private sector has given a most positive lead in bringing the salaries of veterin-

arians close to something worthy of the devotion and effort of this profession. So far, however, the State has not been adequately persuaded, but as in the past it will remain a function and duty of the Association to ceaselessly continue with negotiations in this regard. For the money spent on veterinarians in controlling disease and promotion production in this country is insignificant when compared to the substantial benefits that have accrued. It will indeed be unfortunate and intolerable if the devotion to duty and innate desire to serve the interests of animal and community health continues to be exploited.

As the profession has grown so have the problems affecting our general and individual welfare escalated. Resolution of this situation depends on adequate and functional channels of communication between the mother body and the various branches and groups of the Association which have been formed with our growth over the years. Initially correspondence between regional secretaries, co-ordinating local opinion and comment, and the secretary of the mother body was the only active means of communication. This grew in the early 1950's with the distribution of circulars, initially containing only advertisements for posts vacant, and forthcoming congress information, but later including items of news and comment on pertinent issues such as the controversy surrounding Faculty appointments in 1956. In 1961 the first full-time secretary was appointed to the Association, and this brought a more adequate basis of communication to members by means of a regular newletter. In 1975 the idea of a full-time Director was accepted by the Annual General Meeting, and early in 1976 our first Director was appointed. The significance of this step in promoting communication throughout each facet of activity of the mother body, Branch or Group of our Association can be measured by the greater liaison we enjoy and the extended areas of service which have become available to each member. Regular monthly newsletters carry a wide range of information, bringing each member into more intimate contact with the affairs of the Association. In 1927 the first issue of our Journal appeared. Since that time this official publication of the Association has served a very important rôle in communication, and enjoys a high scientific reputation both locally and internationally. The stirling work and mammoth effort that has gone into, and continues to go into this all important publication, is perhaps never really appreciated by those of us who just receive our quarterly issue of the journal.

At the time when the three provincial Associations came together in 1920 to form one, another very significant event was taking place, namely the founding of the first Veterinary Faculty in this country. This was a matter of the utmost concern to the Association, and our concern for and interest in the education and training of veterinary students has continued every since. Our aim has been to promote and support anything necessary to further the cause of veterinary training. The call for the training of more veterinary students came from this Association; the call for the training of veterinary nurses came from this Association, and the realisation of this ideal was reached recently with the qualification of the first class of "home" trained veterinary nurses. Our concern for the urgency needed to implement the training of non-white veterinarians has been conveyed to the relevant authorities. This is a matter of top priority for reasons both national and international. The Association has always tried, and will always endeavour in an arena that too easily fills with emotionalism, to be totally objective and rational so that the interests of the veterinary profession will be best served and thereby the interests of our country.

An interesting facet of our development over the last three quarters of a century has centred around the debate concerning the use of the courtesy title "Doctor" by veterinarians. A proposal to this effect was received from a colleague N.F. Viljoen from the OFS in 1935. A referendum was conducted, but since the outcome was more or less equal the matter was deferred for further consideration. The issue was again taken up by Dr J. Boswell in 1942, when it was decided to hold another referendum after circularising all members with the pros and cons of this step. While support for the use of a courtesy title was growing it was by no means a cut and dried issue, and opposition was still active. It was not until the end of 1945 that the use of the courtesy title was accepted and the Secretary of Agriculture was informed accordingly by the Association.

The diversification of the Veterinary Profession over the last 75 years has been reflected in the growth of the Association, the establishment of regional Branches and specific interest Groups. Because of our involvement in so many different spheres, our responsibilities in promoting and maintaining the veterinary image have consequently increased. For, while the interests and activities of each sphere of our Association (and profession) may well be specific, in the eyes of the public they reflect on the profession as a whole. Hence the "limelight" scatter has broadened considerably. Similarly what we as an Association do for a specific Branch or Group will certainly be of specific benefit to that branch or Group but in the long term will benefit the overall image of the profession we serve, and is therefore of concern to us all. Every veterinarian in whatever capacity he/she functions is an asset to this country. For as Dr Curson pointed out, despite the fact that we are a small profession, and therefore may not influence the ballot box, no other profession apart from mining engineering, has done more or been more directly responsible for shaping the destiny of this country, than the Veterinary Profession.

These achievements are something that we as a Profession, and an Association, can look back on with a measure of pride. While it will be all to easy to be complacent and sit back and rest on the laurels of those who have gone before us, we have inherited a responsibility to prove we can build on these solid foundations, and that we can continue to maintain veterinary influence in the growth of this country. The contribution of members of the Association in their various capacities in veterinary research, veterinary field services, veterinary teaching and veterinary practice as well as the many new fields we have entered in more recent times has made, and continues to play an important role. The Association must remain vital and sensitive to the requirements of all these areas so that we may be ready at all times to play our part in the promotion of the veterinary profession.

The shortage of veterinary manpower has meant that there have been many things that until now we as a profession have just not been able to entertain. The imminent increase in the numbers of veterinarians that will be available soon, will call for optimal vision, a positive

directive and projection so as to use this long awaited gain to the best advantage of the profession and thereby in the best interests of solving the veterinary problems of this country. This is perhaps the greatest challenge our profession and this Association has had to face. For there are those who sit and wait for the increased numbers in the smug hope that by sheer force of circumstances our cries for the recognition forthcoming to the standing and dignity of our honourable profession will have to cease.

We must not allow the increased numbers to dilute our dignity, to water down our standing or lower our professional competency and responsibility. Rather, they must be used to open up a new era, and expand veterinary function in all those areas where until now we have not functioned optimally or not functioned at all. We must move into an era of veterinary specialisation and internal competition which will set even higher demands and standards, and which have hitherto not always been feasible. We must continue to move up onto a two tier system with the rôle of specialists adding weight to our overall efforts in pursuing the rightful recognition we deserve and have earned in our pivotal position in animal production and community health, ensuring that this is coupled to adequate compensation in terms of job-satisfaction and monetary reward.

If we reflect on the positive achievements of the South African Veterinary Association over the past 75 years, despite often insurmountable odds, and despite the frustrations of protracted time lags, then the future augers well. Through the noble aims and objects to which our Association was committted, we can build on these positive achievements of the past by continuing to be objective in our service to the veterinary profession, as well as those whom we serve. As the mouthpiece of the profession the Association has a major responsibility. Each and every member has a share in that responsibility. By accepting this challenge and acting whenever and wherever the needs of the Profession demand, led by total conviction and belief in the cause we serve, tempered with the necessary discretion, objectivity and wisdom, we can follow in the footsteps of those who have taken our Association through a most colourful and rewarding 75 years.

VAN DIE REDAKSIE

EDITORIAL

ONS TYDSKRIF: VERLEDE, HEDE EN TOEKOMS

In lyn met die algemene gees van ons Vereniging se 75ste bestaansviering en met ingang van ons Tydskrif se tweede halfeeu, is 'n historiese oorsig en besinning oor die blad nie onvanpas nie. Vanselfsprekend is die ontstaan van die Tydskryf die onderwerp van redaksionele kommentaar in die eerste uitgawe. Met elke verandering in formaat of voorkoms, te wete in 1964 (Vol. 35), in 1974 (Vol. 45) en in 1977 (Vol. 48), asook met die naamsverandering in 1972 (Vol. 43), verskyn 'n redaksionele aankondiging, gewoonlik met 'n paar woorde oor redaksionele beleid. Hierdie beleid is breedvoerig uiteengesit in 1971 (Vol. 42 No. 2) en die spesifieke probleem van skryfskuheid is in die derde uitgawe van Volume 34 (1963) aangestip. Vergelyk ons wat aldaar gesê is met die huidige stand van sake, dan blyk dit dat ons nie 'n eenmalige "oplossing" van probleme moet soek nie, maar na bestendige en doelgerigte strewe na verbetering, wat as nimmereindigend aanvaar moet word.

Die Tydskrif, offisiële mondstuk van die SAVV, het in Augustus 1927 die eerste keer verskyn, nie in 1928 soos per abuis in Vol. 35 No. 1 vermeld nie, en wel onder redaksie van G. de Kock, A.C. Kirkpatrick en A. Goodall. Die eerste vier nommers van Volume 1 het jaarliks verskyn. Volume 2 het uit twee nommers bestaan en is halfjaarliks in 1931 uitgegee. Vanaf Volume 3 (1932) het vier nommers per jaar verskyn, soos vandag nog die geval is. 'n Maandelikse uitgawe is al dikwels oorweeg, maar onkoste en veral arbeid is as belemmerings gesien.

Die naam van die Tydskrif is steeds direk aan dié van die Vereniging gekoppel: aanvanklik bekend as „The Journal of the South African Veterinary Medical Association", kry die Tydskrif se naam, asook die aanduiding van volume, nommer, datum en redaksie op die vooromslag vanaf Junie 1956 sy tweetalige beslag. Die bepaalde lidwoord "Die/The" verdwyn vanaf aanvang 1964 (Vol. 35) stil-stil uit die titel, wat met die naamsverandering van die Vereniging vanaf aanvang 1972 (Vol. 43) na "Journal of the South African Veterinary Association/Tydskrif van die Suid-Afrikaanse Veterinêre Vereniging" gewysig is.

Die eerste vier-en-dertig volumes het in 245 x 150 mm formaat verskyn, met slegs die naam, die volume- en uitgawenommer, die datum en die wapen van die Vereniging in swart op die voorblad, aanvanklik ook die name van die redaksielede. In weerspieëling van die teruggetrokke en konserwatiewe aard van ons beroepslui, was die omslag 'n onopvallende dowwe lig- of donkergrys, soms ook lig of donkerbruin; slegs Volumes 31 tot en met 34 het in 'n helderder kleur, oranje, verskyn. Die oorspronklike gemiddelde van 50 tot 60 bladsye per uitgawe het in die vyftigerjare geleidelik begin toeneem met 'n stygende tempo in die jare sestig na 'n gemiddelde van amper 150 bladsye. Dit was voorwaar 'n bloeiperiode. Die formaat is vanaf 1964 (Vol. 35) na 245 x 185 mm vergroot, nog steeds baie handig, met dubbelkolomdrukwerk. Die omslag is sierliker gemaak, nie sonder protes van etlike lede nie, en die kwaliteit daarvan en van die papier stapsgewyse verbeter. Hoofsaaklik die kwessie van koste, maar ook die algemene neiging tot eenvormigheid, het omskakeling na die huidige A4-formaat genoodsaak. Hanteerbaarheid is ingeboet. Die omslag is gewysig. Terwille van vinnige bepaling van die inhoud deur die tydgeknelde leser, verskyn die inhoudsopgawe op die voorblad – 'n voorstel van dr. J.H. Mason afkomstig. Die wapen verskyn nou in kleur. Na 'n periode van meer flambojante proefneming op advies van die destydse drukkers, is die huidige, steeds fleurige, maar meer besadigde en netjiese voorkoms aanvaar. Hopelik sal dit byval vind. Die finansiële implikasie van terugkeer na die platrugmetode van inbind, maar van groter duursaamheid, word ondersoek. In die aangesig van fenomenaal stygende drukkoste is die totale omvang van drukwerk min of meer staties gehou, deels deur die wegkanaliseer van meer huishoudelike verenigingsnuus na omsendbriewe (sien hieronder). Na rowwe skatting het die literariese produktiwiteit met inagname van die groei in mannetal van die professie naastenby konstant gebly. Oor die afgelope twee jaar is daar wel 'n afname te bespeur. Soos verderaan sal blyk, word pogings aangewend om dit te stimuleer.

Vergelyk 'n mens die uitleg en tipografie van die blad, toe en nou, dan blyk dit dat die Redaksie tred probeer hou het met moderne tendense en dat daar 'n duidelike poging was en is om aan internasionale standaarde te voldoen: ons blad dra dan ook sy eie internasionale klassifiserende en identifiserende nommer. Die basiese uitgangspunt bly egter om die blad vir die leser aanvaarbaarder en leesbaarder te maak, ten spyte van uiteenlopende smake. Die kieskeurige kenner sal ook terugverlang na die sierliker druktipes van ouds. Sommige onhebbelikhede is die resultaat van minder geslaagde proefnemings, sommige die gevolg van beperkte beskikbaarheid van lettertipes of kombinasies daarvan, dit meesal as gevolg van ekonomiese oorwegings, anderes weer die uitspruitsel van drukkersgrille wat te veel deur die advertensiewese beïnvloed was en nie betyds gekeer kon word nie, of wat per abuis onder tyddruk oor die hoof gesien is. Laasgenoemde geld veral dié voorbeelde van gebrek aan eenvormigheid van tipografiese uitleg van ooreenstemmende items. Noue samewerking met en basiese kennis van die drukkersbedryf is nodig, ten einde verwarring en tydverspillende en dus duur misverstande uit die weg te ruim. Dié bedryf het revolusionêr verander en is vandag eers hoogs gesofistikeer en gespesialiseer, hoofsaaklik vanweë die invoer van fotografiese kompersetwerk en vlakdrukmetodes: settery en drukkery is aparte bedrywe. Maar die lettersetter van ouds, met sy fyn kennis van tipografiese taalgebruik – en sy toestand van chroniese loodvergiftiging – is nie meer met ons nie. Hy is vandag 'n vinnigwerkende outomaat, 'n knap, hoogsbesoldigde komperbediener, wat nie eers die taal hoef te ken wat hy set nie. Dit werp die verantwoordelikheid op outeur en redakteur, om kopie, pynlik korrek tot in die puntjies, te lewer. As gevolg van oorlegpleging met

setters en drukkers hoop die Redaksie om oorblywende ongerymdhede spoedig uit die weg te ruim.

Die verpligte navolging van die „Système International" (SI) van die metrieke stelsel bring mee dat outeurs hulle met hierdie stelsel vertroud moet maak sover dit die mate betref wat hulle gebruik. Onlangse evaluering van die Tydskrif deur die Buro vir Standaarde het sekere foutiewe gebruike in die verband aan die lig gebring. Die belangrikste was dat hoeveelhede en maattipe deur 'n spasie geskei moes word, bv. 10°C en nie 10°C nie, so ook 80 %; 100 gm. Lesers sal gewoond moet raak aan a vir jaar/jare, d vir dag/dae en h vir uur/ure (maar Dag 1, Dag 2, ens.).

Informele oorleg met binne- en buitelandse redakteurs onder beskerming van die Stigting vir Onderwys, Wetenskap en Tegnologie sal teen die tyd dat hierdie stuk in druk verskyn, bepaal het in hoeverre u Redaksie na vele proefnemings en bittere ervaring daarin geslaag het om 'n aanvaarbare vorm vir literatuuropgawes te verwesenlik.

Al hierdie ontwikkelings bring mee dat 'n nuwe handleiding vir bydraers tot die blad opgestel sal moet word.

Ter wille van geskiedkundige boekstawing en van beter begrip by ons lede, word een en ander omtrent die redaksiepersoneel vermeld. Die Redaksiekomitee het altyd, en sal in die afsienbare toekoms, uit kollega's bestaan wat deur die Raad benoem word, outodidakte wat deur harde ervaring maar self die kuns moes aanleer, lang ure êrens uit 'n besige bestaan moes afknyp om teen hoë tyddruk geduldmergelende, vitterigheidvereisende take uit te voer, terwille van die liefde vir die saak, met vrywillige hulp van 'n gewillige eggenote of assistent hier en daar. Al die jare was dit maar 'n soort lukraak, gryp-soos-jy-kan metodiek. Elke uitgawe is dan ook met 'n effens verbaasde gevoel van dit-het-sowaar-tog-reggekom begroet, getemper deur wroeging oor al die foute wat, ten spyte van alle voorsorg, tog deurgeglip het. Die betreklik onlangs ingestelde honorarium word as erkentlikheidsgebaar met waardering aanvaar.

Die getal redaksielede het na die eerste nommer van drie na vier gestyg, vanaf 1932 na vyf en vanaf September 1952 na ses. Vanaf September 1957 verminder die getal weer na vier, maar styg weer geleidelik, met kortstondige verminderings tussenin, vanaf Desember 1961 tot die huidige getal van nege. Vanaf aanvang 1974 neem 'n verteenwoordiger van die Finansieskomitee ook sitting op die Redaksie. 'n Paar name kan hier uitgelig word. Die Direkteur van Veeartsenydiens, eers P.J. du Toit van 1931 tot sy aftrede in 1948, toe G. de Kock, opgevolg deur J.I. Quin, het op die Redaksiekomitee gedien, 'n mens kan aanneem meer in adviserende hoedanigheid. Persone wat jare diens gelewer het, afgesien van die jare van redakteurskap wat tussen hakies agter hulle name aangegee word, is A.D. Thomas (1932-1936), C. Jackson (1936-1937), M. Sterne (1937-1942), E.M. Robinson (1942-1947; 1951-1958), R. Clark (1947-1951; 1959; 1965; 1967-1970), L.W. van den Heever, op die redaksie sinds 1952 en Redakteur 1975-1978, en die huidige Redakteur (lid van die Redaksie sinds 1950 en voorheen Redakteur 1959-1961; 1970-1975). Daarbenewens moet ook die name genoem word van manne soos J.H. Mason, M.H.V. Brown, H.P. Steyn, G.C. van Drimmelen, W.D. Malherbe, K. van der Walt, M. de Lange, J.M.M. Brown, R.K. Loveday, L. Coetzee, R. Bigalke en, onder die huidig nog dienende lede, P.G. Howell en R.C. Tustin. Spesiale erkenning moet gegee word aan die garde anonieme persone wat, omrede hul gespesialiseerde deskundigheid, as beoordelaars opgetree het, meer nog, moeitevolle ure onbaatsugtiglik gespandeer het om uitvoerige voorstelle ter verbetering van ingesonde stukke aan die hand te doen. Ewe eens moet die naam van mev. M. Marais genoem word: vir haar toegewydheid oor baie jare kan die Redaksie nie dankbaar genoeg wees nie.

Na sy finale aftrede uit die Staatsdiens in 1961 het dr. A.M. Diesel die Vereniging se eerste voltydse sekretaris geword, wat tewens tot sy afsterwe in 1965 ook die redakteurskap gehanteer het. Hy is opgevolg deur dr. W.C. Ryksen, tot 1967. Hierdie aanstellings was die eerste stap op weg na 'n voltydse Direkteur. 'n Voltydse Redakteur, en eventueel ook 'n voltydse redaksionele personeel, sou dan ook as toekomsbeleid die aangewese weg skyn te wees. Feit bly, dat 'n persoon aan die stuur moet staan wat meer tyd het om oor redaksionele aangeleenthede te besin, om meer aaneenlopende aandag daaraan te gee en om dienooreenkomstig op te tree as wat in die verlede die geval was. Moontlik is ons daarheen onderweg, en het ons huidig met 'n afgetrede persoon as redakteur 'n soort kompromis- of halfwegsituasie bereik.

Die werkwyse van die Redaksie verg direkte en onmiddellike kontak te eniger tyd tussen sy lede. Oor die jare is in die praktyk ervaar dat lede geografies binne onmiddellike bereik van mekaar moet wees. Om dié rede, en om dié rede alleen, is lede te Onderstepoort (Instituut en Fakulteit) gelokaliseer, ten spyte van die teoretiese ideaal van wyer verspreiding. Ervaring het ook geleer dat persoonlike kontak met plaaslik geleë drukkers 'n vereiste is. Hier is dit 'n geval van: „Distance lends disenchantment".

Dit word beplan, en is aanvanklik reeds uitgevoer. om minstens een formele redaksiekomiteevergadering per jaar te hou, waar beleid in oënskou geneem kan word, afgesien van informele werksbyeenkomste. Deur die *ex officio* sitting van die President en Vise-president op die vergadering, die vaste uitnodiging van die Direkteur en die verteenwoordiging van die Finansieskomitee, word sorg gedra dat die nodige verband tussen die Redaksiekomitee se werksaamhede en dié van die Vereniging gehandhaaf word.

As offisiële mondstuk van die Vereniging het die Tydskrif verslae oor die Algemene Jaarvergaderings, later ook oor dié van Takke, en algemene verenigingsnuus bevat. Die uitbreidende ledetal het behoefte aan spoediger kommunikasie van verenigingsnuus en sake van huishoudelike en meer persoonlike belang laat ontstaan. Indringende oorweging van 'n maandelikse of selfs weeklikse uitgawe van die blad, van koste, tyd en die wenslikheid al dan nie om meer vertroulike sake aan die buitewêreld te verkondig, het gelei tot die instelling van 'n maandelikse omsendbrief in Januarie 1957. Die ideaal om die omsendbrief tot 'n volwaardige publikasie uit te bou is eers in April van hierdie jaar met die verskyning van Vet. Nuus/News verwesenlik. Daar is nou bepaal dat Vet. Nuus 'n *vertroulike* interne kommunikasiemedium vir lede sal wees. Huishoudelike en ander sake wat spoedeisend onder lede se aandag moet kom, asook personalia word daardeur behartig. Wat laasgenoemde aspek betref, sal die Tydskrif slegs, soos in die verlede, toekennings wêreldkundig maak. Anders as voorheen sal *obituaria* net van vooraan-

staande lede in die Tydskrif verskyn. Dit staan enigeen vry om 'n volledige *Obiit* van 'n oorledene op te stel en in te stuur; die President sal bepaal in watter medium dit gepubliseer sal word. Die Redaksie word onthef van die tydrowende en aandagvergende verpligting om te sorg dat vir elke oorlede lid 'n doodsberig verskyn.

Die advertensie-inkomstepotensiaal van die Tydskrif is nooit ten volle benut nie. Tyddruk op die Redaksiekomitee, asook gebrek aan besigheidservaring en kontakte het veroorsaak dat nie die nodige aandag hieraan gewy kon word nie. Danksy bemoeiing van die Finansieskomitee is destyds tariewe aangepas om tred te hou met algemene kostestygings. Deur die advertensiepotensiaal van die Tydskrif en van Vet. Nuus en die inkomste daarvan as 'n eenheid te beskou, kan 'n soepeler werkswyse met aantrekliker voorwaardes vir adverteerders gevolg word. Toevallige oop ruimtes in die Tydskrif kan benut word om gevestigde adverteerders te begunstig. Deurgaans sal 'n kragdadige advertensiewerwingsveldtog geloods en gevolg moet word. Die benutting van werwingsagente word ondersoek. Die Redaksie sal hulp in hierdie verband van Veeartse-in-Industrie verwelkom. Lede kan behulpsaam wees deur adverteerders te ondersteun en dusdanige ondersteuning by die betrokke handelsfirma's bekend te stel. Die Vereniging is al in die verlede deur uitgewersfirma's genader met die aanbod om die Tydskrif kosteloos te druk en te versprei. Ter wille van die aansien van die Tydskrif is tot nog toe nie hiervan gebruik gemaak nie. Nog die Tydskrif, nog Vet. Nuus, is 'n instelling op winsbejag. Die Tydskrif word dan ook deur 'n jaarlikse subsidie van die Departement van Nasionale Onderwys ondersteun, waarvoor die Vereniging en die Redaksie met reg dankbaar is.

Wat sirkulasie betref, word hier volstaan met enkele statistiese grepe uit die beperkte beskikbare syfers.

	1972	1976	1978
Lede			
Binne die RSA	650	761	840
Buitelands	50	64	78
Subskripsies			
Binne die RSA	22	19	34
Buitelands	258	250	204
Uitruil			
Binne die RSA	32	24	25
Buitelands	104	80	76
Totaal	1 116	1 198	1 257

Die afname in uitruilnommers is te wyte aan ingrypende hersiening van die uitruillys: die Redaksie moes bepaal dat die Vereniging werklik waarde vir sy geld kry. Tydskrifte wat in ruil ontvang word, word aan die Veeartsenykundetak van die Merensky-biblioteek geskenk, waar hulle behoorlik versorg word en vir alle lede toeganklik is. Inaggenome die gunstige reaksie op publikasie in die Tydskrif, gemeet aan die aantal versoeke om herdrukke, bestryk die Tydskrif 'n aansienlike deel van die wêreld. Die moontlikheid is natuurlik nie uitgesluit nie dat van hierdie versoeke indirek deur bemiddeling van uittrekselpubliserende tydskrifte kom nie. Ook wat sirkulasie betref, kan lede help deur ons Tydskrif te propageer.

Die voertaal van die Tydskrif was aanvanklik uitsluitlik Engels. Eers in 1942 (Vol. 13 No. 3) verskyn 'n artikel in Afrikaans, nl. „Akuut (!) Timpanitis (!) (Opblaas) by Herkouers" deur J.I. Quin, gevolg deur 'n kliniese aantekening deur T.B. Nel in 1946 (Vol. 17 No. 2) en deur 'n oorsig oor die gebruik van *Brucella abortus* (Stam 19) entstof in S.A. deur G.C. van Drimmelen in 1948 (Vol. 19 No. 4). In die tien jaar daarna verskyn nege artikels in Afrikaans, in die daaropvolgende tien jaar 35. Die eerste redaksionele stuk in Afrikaans verskyn in 1963 (Vol. 34 No. 3). Tot hede is die getal Afrikaanse artikels nog ver in die minderheid. Die redes vir die hele verskynsel kan as volg opgesom word: die aanvanklike groot oorwig Engelsprekendes in die professie; die mag van gewoonte; die geredelike inval by bestaande gebruike; konserwatisme; en veral die sterk oorweging van noodsaak vir internasionale kommunikasie. Doelbewuste taalmiskenning was daar nooit. Afrikaanse bydraes word allerweë verwelkom, mits die uittreksel in Engels meer omvattend as andersins gebruiklik is.

Om tot die kern van die saak – die blad se inhoud – te keer, moet die eenvoudige feit herbeklemtoon word dat ons Tydskrif geheel en al van sy bydraers afhanklik is. Die Redaksie tree bloot as monitor en prosesseerder op. Die uiteindelike produk is die resultaat van die wisselwerking tussen die skeppende arbeid van sy bydraers, die oordeel en skaafwerk van die Redaksie en die fisiese arbeid van setters en drukkers. Die gehalte daarvan moet vir homself getuig. Dit sal help as lede wat van tyd tot tyd in buitelandse professionele kringe beweeg 'n oor oop sal hou vir geluide, gunstig of ongunstig. Bemoedigend is die waarderende briewe wat dan en wan ongesolisiteer opdaag, veral dié van belangelose buitestaanders. Hoofsaak bly egter verantwoordelike kritiek uit eie geledere, in besonder as dit die resultaat van indrinende bespreking en besinning van 'n aantal lede soos 'n Tak of Groep is. Die voorbeeld wat deur die Weskaaptak gestel is, kan gerus nagevolg word.

Die funksies van die Tydskrif moet weer eens voorgehou word:

1. Die behoud en versterking van onderlinge verband tussen lede, veral met oog op die sentrifugale effek van die huidige sterk diversifikasie van werksaamhede en belange, belange wat soms, oppervlakkig beskou, mag skyn te bots.
2. 'n Weerspieëling van die professie se aktiwiteite, waardeur hy hom aan kritiese eiewaardebepaling kan onderwerp.
3. Verskaffing van voorligting en aanduiding van riglyne vir professionele optrede en werksaamhede.
4. Bevordering van professionele belange deur op verantwoordelike wyse knelpunte vreesloos en akkuraat te identifiseer, moontlike oplossings aan die hand te doen en optrede vir die toekoms te bepaal.
5. Bevordering van voortgesette opleiding d.m.v. inligting-, oorsig- en ander stukke van didaktiese aard, asook deur publikasie van navorsingresultate.
6. Verskaffing van nuttige praktiese inligting.
7. Byhou van historiese dokumentasie, veral met die oog op wat die verlede ons kan leer.
8. Bevordering van veeartsenykunde in die algemeen en veeartsenykundige wetenskap en praktyk in die besonder. In die teken van huidige neigings moet die blad hom ook op interdissiplinêre terrein begewe. Vanselfsprekend sal Vet. Nuus 'n aanvullende en sterk ondersteunende rol speel.

Beskou 'n mens die Tydskrif oor die jare, dan is daar wel 'n eerlike en volgehoue poging aangewend om aan al hierdie funksies te voldoen. Redaksionele beleid het

basies bestendig gebly: sien ook Vol. 42 p. 99. Omsendbriewe is nou aan alle Takke, Groepe en Komitees van die Vereniging gestuur om weer eens daarop te wys dat die Vereniging kopiereg hou t.o.v. publikasie van referate wat tydens byeenkomste gelewer word, dat alle dusdanige referate na die Redaksie vir keuring met oog op publikasie gestuur moet word, en dat slegs by uitsondering publikasie elders toegelaat sal word.

Op veterinêr-politieke gebied was die toon van ons blad 'n beskeie een. Weliswaar was met enkele uitsondering die 110 stuks redaksionele artikels in die 194 uitgawes van die blad in hierdie trant, aangevul deur die onderskeie Presidentsredes, gepubliseerde toesprake en sekere algemene artikels. Desnieteenstaande sal die oningeligte buitestaander meesal – met moontlike uitsondering van die eerste aantal bande – tussen die lyne moet lees om werklik onder die indruk te kom van die professie se wordingstryd en sy stryd om erkenning. Etlike sake wat deur lang, geduldige en hardnekkig volgehoue pogings van die Vereniging opgelos of na 'n meer aanneemlike vlak verhef is, het nie voldoende weerklank in die Tydskrif gevind nie. Beskeidenheid is 'n groot deug, maar selfs deugde kan oordryf word. Daar word ook ruimskoots toegelaat vir goeie maniere om nie „vuil wasgoed in die openbaar te was" nie. Veral Groepe en Komitees kan help deur self stukke op te stel, of opdrag aan 'n geskikte persoon te gee om dit te doen, of die nodigekte, argumente en sienings aan die redakteur te verskaf.

Met redelike bevrediging kan 'n mens na die getal navorsingartikels kyk. Dank word weer eens aan die Direkteur van die Veeartsenykundige Navorsingsinstituut betuig dat soveel werk van lede van die Instituut in die Tydskrif kon verskyn. Huidig word navorsing in toenemende mate ook buite die Navorsingsinstituut gedoen en beweeg al hoe meer op interdissiplinêre en interprofessionevqak. Hiervoor bied die Tydskrif 'n uitstekende platform. Dis dan ook beleid om bydraes van buite die Vereniging se ledekring en ook van buite die professie te verwelkom. Met toenemende spesialisasie en sofistikasie gebeur dit onvermydelik dat al hoe meer van die terrein van praktiese kliniese diergeneeskunde weg beweeg word. Die in sekere opsigte geregverdigde kritiek is gelewer dat die Tydskrif nie meer die belange van die meerderheid lede dien nie. Die regstelling lê duidelik daarin dat meer artikels van kliniese g moet verskyn, nie in inkorting van meer akademies geöriënteerde materiaal nie. Dis 'n baie ou turksvy, hierdie: sien Vol. 34 p. 315. Die grondliggende feite bly dat die praktiserende dierearts min geleentheid kry om te skrywe, die atmosfeer waarin hy beweeg is nie-akademies, hy het nie so geredelik toegang tot literatuur nie, hy is van geaardheid minder akademies ingestel (anders sou hy hom nie in die praktyk begewe het nie), geleenthede ontbreek om hom in die smartlik verkreë wetenskaplike skryfkuns te bekwaam, hy is nie so aan kritiekblootstelling gewoond soos sy akademiese kollega's en dus meer sensitief daaromtrent, skryfwerk bring hom niks in die sak nie en beteken net meer onkoste. Die eerste stap is om hierdie feite nugter onder oë te neem, en hulle terdeë te besef en te aanvaar. Dit doen die Redaksiekomitee reeds: vergeleke met redaksies van baie soortgelyke publikasies doen komiteelede en buitestaande referendarisse eindeloos meer moeite – dae en dae van werk wat van hul normale aktiwiteite afgekynp moet word – om bydraes redaksioneel by te werk en uitvoerige voorstelle vir verbetering aan die hand te doen. Daar is egter perke van redelikheid wat nie uitbuitend oorskry mag word nie.

'n Spook wat besweer moet word is die waanbeeld dat bydraers ontmoedig word deur onoordeelkundige afwysing of snedige redaksionele kritiek. Soos op so baie terreine van die lewe bestaan ook hier wanindrukke en halwe waarhede wat populêr as die ware Jakob aangegryp word. In werklikheid is dit slegs die enkele artikel wat afgewys word, nie meer as twee of drie per jaar nie; dit geskied slegs op advies van bevoegde beoordelaars, gewoonlik twee of meer, wat nie noodwendig lede van die Redaksiekomitee hoef te wees nie, en wat volgens 'n standaard vraelys vir beoordelaars werk. Voorheen is ter wille van tydbesparing slegs 'n geykte afwysingsbrief in sulke gevalle uitgestuur. Op aandrang van die jongste Algemene Jaarvergadering is dié beleid in heroorweging geneem: voortaan sal redes vir afwysing verstrek word. Redelike repliek en verduideliking bly elkeen se demokratiese reg, maar om begryplike redes kan die Redaksie hom nie met uitgerekte polemieke inlaat nie.

Wat wysigings van bydraes betref, kan in alle eerlikheid gemeld word dat verreweg die meeste outeurs sodanige wysigings in goeie gees aanvaar, of met verdere verduidelikings aktief meehelp om 'n hoër gehalte eindproduk te verseker. Die huidige Redakteur kan hom slegs drie gevalle herinner waar eksepsie geneem is en een waar die betrokke skrywer glad nie op redaksionele aanbevelings gereageer het nie. 'n Mens kan slegs hoogste waardering hê vir diegene wat gewilliglik vir die soveelste keer 'n artikel herskrywe. 'n Woord van spesiale erkenning word gerig aan bydraers wat geen moeite ontsien om die vereiste formaat na te kom nie, wat sorg dat indeling, uittreksel en bronnelys keurig in orde is en dat tabelle en figure in paslike vorm aangebied word.

Om onnodige arbeid te vermy kan outeurs, in gevalle van onsekerheid of 'n beplande artikel in beginsel wel geskik sal wees, vooraf 'n uiteensetting aan die Redaksie vir kommentaar stuur. Dit is 'n handige proses wat deur sommiges reeds benut is. 'n Tweede uitweg is om die artikel in konsepvorm vir beoordeling voor te lê. Dit moet egter nie van die Redaksie verwag word om 'n haastig saamgeflanste konkoksie te herskrywe nie! 'n Derde metode, waarvan veral die onervare aspirantskrywer gebruik kan maak, is om 'n meer ervare kollega te betrek, desnoods as medeouteur. 'n Voorstel in dier voege is op die vorige Algemene Jaarvergadering gemaak. Die Redaksie kan dit nie as beleid voorskrywe nie, maar dit staan enigeen vry om so 'n prosedure te volg.

Daar is baie kollega's wat oor allerlei wetenswaardighede en nuttige wenke beskik, inligting wat nie 'n formele artikel regverdig nie, maar wat beslis met mekaar gedeel behoort te word. So ook loop kollega's allerlei probleme van diagnostiese, terapeutiese, preventatiewe of organisatoriese aard op die lyf. Waarom nie hierdie probleme met oog op soek na oplossings met mekaar deel nie? Die opinie is al uitgespreek dat ons sodoende baie gouer op die spoor van die bestaan van voorheen nie vermoede siektes in die land of streek sal kom. Ook sal siektes in versluierde of vermomde vorm gouer herken kan word. Sulke mededelings kan met minimum inspanning d.m.v. 'n brief aan die Redakteur bewerkstellig word. Is daar voldoende toevloei daarvan, kan aparte rubrieke soos „Kliniese Kommunikasies", „Praktiese Wenke" e.d.m. ontgin word. Ons

het reeds 'n „Vraag en Antwoord"-rubriek, waarin tot dusver meer algemene vrae van akademiese aard beantwoord is.

Wetenskaplike skryfwerk is lastig en veeleisend, maar die verskoning: „Ek kan nie skrywe nie" beteken in der waarheid: „Ek is te lui om die saak deeglik te deurdink". Die goue reël bly: „Besin eer jy begin". Dan volg 'n paar toetsvrae: „Is my stellings wetenskaplik verantwoord? Is my uiteensetting logies?" „Het ek myself duidelik en ondubbelsinnig, sonder omhaal, uitgedruk?" In hierdie hele verband word verwys na wat reeds in 1963 (Vol 34 No. 3 p. 315) gestel is, asook na die President se oproep in die Oktober-uitgawe van Vet. Nuus. Die toekoms bly dus een van bestendige voortsetting en ontwikkeling van die verlede. Ons sluit af met aanhaling van 'n strofe uit 'n Nederlandse weerstandsbewegingliedjie:

„We komen d'r wel,
„Maar we zijn d'r nog niet".

NOTICE TO AUTHORS

KENNISGEWING AAN BYDRAERS

STYLE OF REFERENCES

To support the move towards international standardisation of rendering references, the Editor has decided that as from Volume 50 (1979) the suggestions, recently made by a Ciba Foundation Workshop and discussed at the First International Congress of Scientific Editors in Jerusalem as well as at an informal meeting of editors of biological journals held in Pretoria on October 31, 1978, will be put into effect. As far as this Journal is concerned, it implies a further streamlining and simplification of the system already in use, according to the following examples:

Examples of style to be used in reference list:

du Toit A E, MacDonald J 1975 The excretion of *Escherichia coli* by pigs under stress. Journal of the South African Veterinary Association 46: 91 – 98

2. O'Connor P 1967 Symptoms of stress in pigs. In: Roos T, Marais M (eds) Stress in Man and Animals 2nd end. Elsevier/Excerpta Medica/North Holland, Amsterdam

A. In the list of References

1. authors' names will *no longer be given in capitals*, but in upper and lower case;
2. full stops after initials fall away;
3. the use of at least one christian name in the case of authoresses falls away (but is retained under the title of an original article);
4. authors' surnames must be rendered exactly as spelt, including prefixes such as de, De, van, von, O' etc. and alphabetised accordingly. Mc must not be alphabetised under Mac.
5. only a comma separates authors' names, where there are more than one; the ampersand (&) falls away;
6. the *full* stop after the journal title – in full – falls away;
7. the *number* of a volume will only be necessary (in parentheses) in those instances in which each issue of a volume starts from page 1, as happened in Vol. 39 of this Journal, e.g. 39(2): 45–47;
8. not only the first page, but also the last of each reference must be given;
9. anonymous authors are indicated by their status, e.g. Editorial; Director of Veterinary Services; Chief Librarian; or by the name of the body to which they belong and on whose behalf they make a published statement: Royal Commission on...; Joint Committee on...; WHO; Republic of South Africa, Department of Agricultural Technical Services; Republic of South Africa, Government Notice No. ...; etc. Such titles or names are arranged alphabetically with those of named authors;
10. the titles of articles in script other than Latin (e.g. Cyrillic, Arabic, Japanese) must be given in English in square brackets, followed by the name of the language in ordinary parentheses. The names of authors and journals titles must be transliterated, unless, in the latter case, the journal also bears an official title in a Western language;
11. in the case of books, the publisher's name is given and then the main city in which the publishing house is situated;
12. terms such as 'ibid.', 'idem', 'op. cit.' and 'loc. cit.' are not to be used as substitutes for complete references;
13. when reference has to be made to a publication not available to the contributor, the full reference must be given if at all possible, followed by the full reference to the citing author(s). If the latter already appear(s) in the list of references, then the (first) author's name (followed by 'et al.') and the reference number will suffice;
14. do not underline any part of the reference: italics and bold type fall away;
15. although titles of journals are to be given in full, any initial 'The' or its equivalent is dropped; all important words start with a capital, irrespective of usage in that particular language (e.g. German); titles of books are treated in the same way; per contrast, titles of articles appear in lower case only except where spelling rules demand otherwise.

B. In the Text

1. if names are referred to, use '&' to indicate co-authors, 'and' to indicate different publications, e.g.:
   Jones & Smith[4] found ...
   Jones[4] and Smith[6] found ...
   Brown et al[2], Jones & Smith[4] and Robinson[7] have confirmed ...;
2. if reference has to be made to *three* or more co-authors, use the form 'X et al' *from the start;*
3. cite personal (not 'private') communications and unpublished work (not 'in preparation'), as well as any unpublished proceedings or reports *in the text only,* not in the reference list, in the following form:
   ... as was demonstrated recently (J Smith 1977 Veterinary Research Institute, Onderstepoort, personal communication). ... treatment was successfully applied (P Jones 1977 Unpublished work, presented at 1977 Biennial Scientific Congress, South African Veterinary Association, Grahamstown, 30 August).
   The first case of the disease was recorded in this area in 1971 (Department of Agricultural Technical Services, Division of Veterinary Services, Report by State Veterinarian Ixopo 1972 File 381/3).

These instructions are to be followed pending the issue of a Guide to Authors.

OPEN SYMPOSIUM ON MASTITIS CONTROL IN DAIRY HERDS: A POSITIVE STEP INTO THE FUTURE OF LARGE SCALE PREVENTIVE VETERINARY MEDICINE IN THE REPUBLIC OF SOUTH AFRICA

An Open Symposium on Mastitis Control in Dairy Herds was one of the major events organised by the South African Veterinary Association to mark its 75th Anniversary and to put the occasion to most fruitful use. The Symposium was held at the Conference Centre of the Council for Scientific and Industrial Research, Pretoria, from August 10 to 12, 1978. It was attended by wellnigh 300 delegates, and included veterinarians, animal scientists, extension officers, breeders, producers of fresh and of industrial milk, milk distributors, and members of the Faculty of Veterinary Science, of various Faculties and Colleges of Agriculture, of the State Department of Agricultural Technical Services, the Department of Agricultural Economy and Marketing, the Institute for Veterinary Research, the Institute for Animal Science and Dairying, the State Department of Health, the Dairy Board, the Milk Board, the Artificial Insemination Coöperative Insemina, the S. A. Milking Machine Association and the Consumer Council. Also attending were Dr O. Klastrup from Denmark and Dr G. F. Morse from the United States, as well as guest speakers from Rhodesia. The proceedings of the Symposium are being published as an entity separately from this Journal. Details regarding price and placing of orders appear on page 294 of this issue of the Journal.

Thirty-five papers were presented. Summaries of the proceedings of the first two days were given, an open session was held on the Friday afternoon, and the proceedings were finalised by a general discussion with qustions and answers and by an opportunity for the adoption of resolutions.

The purpose of the Symposium was defined as an attempt to:

1. exchange information, knowledge and views on bovine mastitis in general between representatives and individuals in any way concerned with and interested in the problem;
2. outline the nature and extent of the mastitis problem and the effect thereof on the dairy industry as a whole;
3. discuss herd control of bovine mastitis with special reference to organised schemes applied in other countries and to schemes or methods which may be regionally or nationally applicable in South Africa, taking into account factors such as personnel, facilities, cost, benefits, etc.; and
4. form a national representative body for promoting mastitis control in the Republic of South Africa.

Thanks to careful preparation, the Symposium succeeded beyond expectation: it reached all four major objectives and its participants unanimously resolved that:

1. a representative National Mastitis Action Counci be established to consider, promote and introduce a National or Regional Cooperative Udder Healtl Improvement Programme, as well as assist, promote and finance research and investigation which wil further the aims of such a Council;
2. the SAVA be requested to approach formally all the parties concerned, to nominate a representative tc serve on such a Council; and
3. the Minister of Agriculture be invited to give his patronage to such a Council, and to take the chair a the Inaugural Meeting of delegates to be held at ar early date to form such a Council.

The Resolution is especially noteworthy because it was passed at a time when past achievements and future tasks of the veterinary profession in South Africa were being reviewed. Its adoption hardly could have been timed more perfectly. In terms of the Resolution, the SAVA received a clear vote of confidence on the previous achievements of the veterinary profession and was given an equally clear mandate to press on with the introduction of a National Udder (or Dairy Cattle) Health Service.

Such a commitment to preventive veterinary medicine on the herd level may be viewed by members of the profession with some doubt and scepticism regarding the feasibility of and necessity for such a comprehensive programme. Appreciable difficulties must also be expected to arise between conception and birth of the scheme. Whatever the problems, it is conceivable that their satisfactory resolution will become so much easier if the profession as a whole already commences immediately to work purposefully towards the common goal outlined at the Symposium, namely a National Mastitis Council. Its organisation and effective operation seems imperative to further developments in veterinary medicine and dairy farming.

Specialised preventive veterinary medicine comprises a significant component of the veterinary services rendered to dairy industries of most countries where milk production has become an intensive and specialised animal industry. Under such conditions, dairy farming is faced with tough competition and it is compelled, therefore, to utilise all possible means of rendering its operations more efficient. In the face of growing consumer resistance, any improvement of the agricultural income by raising the producer's price no longer seems practical. Hence dairy farming must rationalise; it is already centralising geographically and increasing its scale of activities in climatically suitable areas; both the number of cows per farm and the number of cows managed per worker are escalating; mech-

anisation has advanced especially rapidly on fresh milk producing farms.

These trends are of great significance to an organised mastitis control programme because:

1. the scale of activities on large farms usually justifies more intensive disease control programmes; and
2. intensive dairy farming is aimed at optimal output at the lowest possible cost within a minimum of time.

The latter only becomes feasible where animals with a high genetic potential for productivity are bred, reared and kept under optimal environmental conditions. The closely calculated production programmes leave no room for unforeseen incidents, especially production losses owing to mastitis and other disease. It is thus no longer sufficient to keep animals in good health by means of conventional methods; it becomes essential, instead, to monitor udder and cattle health regularly for early symptoms of managerial deficiencies and to prevent the onset of functional, developmental and productive reverses.

The cost of a mastitis control programme must, of course, be in reasonable proportion to the economic success of the dairy farm. Nevertheless, cost can be reduced considerably by including other erosive conditions in the control programme. Moreover, the programme has to be acceptable to the dairy farmer. In view of the narrowing profit margin of dairy farming, there are three possible economic justifications for the farmer to implement such a programme, namely:

1. increase of profitability of milk production by increased efficiency with which resources are used, thereby reducing the average cost of production;
2. significant limitation of disease outbreaks, thereby reducing uncertainty of income; and
3. increased opportunity for diversification by being able to reduce herd size and/or change the herd replacement pattern according to the dicates of necessity, which, in turn, reduces the number of calves that must be reared annually for dairy purposes.

Dairy farmers most probably will be slow in adopting such a programme because the economic losses both from mastitis and infertility are erosive rather than catastrophic in nature and thus less apparent. Most dairy farmers, also, are traditionally conservative in investing funds in new and unaccustomed ways. In the absence of an appropriate financial incentive, the motivation of the farmer will be limited further unless he is educated to see and actually experiences the benefits from the control programme. Owing to all these reasons, knowledge available for the control of largely preventable cattle diseases has been under-utilized for too many years. The prime evidence for this fact is the high prevalence of mastitis and infertility in South African dairy herds, despite the high returns which can be expected from a properly organised disease control programme. Hence it would appear to be of considerable value to stimulate increased investment in the programme proposed at the Symposium. For that purpose, a positive financial incentive by means of an appropriate scheme of payment on milk quality, rather than a negative system of penalties, should be provided. A price incentive for the production of milk with an acceptable level of somatic cells per mℓ of milk would be justified from the viewpoint of the consumer; it would facilitate simultaneously a profitable investment by the farmer in voluntary disease control on the herd level. By adopting such control measures he will be able to keep bills for veterinary treatment and costs of remedies that constantly erode profits and form the focus of the computation of the operating costs of his agricultural enterprise as low as possible.

The development of the specialised multidisciplinary service proposed at the Symposium requires a thorough re-orientation and rapid adjustment to the new situation by the veterinarian. How important it is for the veterinary profession to adapt quickly and become totally committed to such specialised professionalism with all its implications are exemplified by the facts that:

1. general conditions of dairy farming are most disconcerting, expecially in respect to the prevalence of mastitis;
2. despite increased value of dairy cattle and cost of remedies, dairy farmers continue with their own and all too frequently unsuccessful attempts at treating diseased animals without consulting a veterinarian; and
3. practising veterinarians are relegated to the rôle of drug pedlars and/or emergency helpers, instead of being consulted as experts competent in matters of animal health and disease prevention.

From the above it is apparent that the specialised multidisciplinary service proposed at the Symposium should be appreciated by the profession as a whole. It is an attempt at alleviating several serious unfavourable conditions of major veterinary and agricultural concern already indicated previously[2 4 5]. It is hoped that such an appreciation will receive the sustained professional support and effort so essential for the organisation and actual functioning of the National Mastitis Council. The latter can and must become a milestone in the evolution of preventive veterinary medicine in South Africa. It should be regarded as an attempt at creating a professional infrastructure, especially in the rural areas, of particular significance for:

1. greater productivity in dairy farming to control losses from mastitis at present estimated to amount to a total of R 185,78 x 10^6/a[3]; and
2. improved productivity in the cattle industry as a whole and the control of largely preventable stock losses that amount to some R 359 x 10^6/a (presumably including mastitis)[1].

With due consideration to such losses and to future development and credibility of the veterinary profession in this country, early inauguration of a National Mastitis Council seems a worthwhile and most important undertaking. The SAVA fully deserves to be congratulated on its initiative shown during the Symposium by promoting the initiation of such a Council. One is now almost equally tempted to express the best wishes for a resounding success. It is felt, however, that such wishes alone will not suffice to overcome the many obstacles that doubtlessly will occur during further developments. Much more comforting to the Association will be, instead, the knowledge that, irrespective of the problems encountered, it can always be sure of full support of the veterinary profession at all levels. May such support be forthcoming whenever required!

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BOEKAANKONDIGING

HANDELING VAN DIE SIMPOSIUM OOR DIE BEHEER VAN MASTITIS IN MELKKUDDES

Al die referate wat tydens die Simposium oor die beheer van Mastitis in Melkkuddes van 10 to 12 Augustus in Pretoria gelewer is, plus die besprekings wa op elke referrat gevolg het, word tans in boekvorm gedruk en sal vroeg in Januarie 1979 beskikbaar wees. Dit beloof om 'n waardevolle bundel te wees vir alle persone wat by die suiwelbedryf in die RSA betrokke is, hetsy as studente, melkprodusente, tegnoloë, veekundiges, vervaardigers, wetenskaplikes of veeartse.

Die prys van die Handelinge is R10 per eksemplaar. Belangstellendes word aangeraai om vroegtydig hulle bestellings te plaas by the S.A. Veterinêre Vereniging, Posbus 26498, Arcadia. 0007; geen waarborg kan verstrek word dat bestellings wat laat ontvang word, wel uitgevoer gaan word nie.

BOOK ANNOUNCEMENT

PROCEEDINGS OF THE SYMPOSIUM ON THE CONTROL OF MASTITIS IN DAIRY HERDS

All the papers presented at the Symposium on the Control of Mastitis in Dairy Gerds on 10 to 12 August in Pretoria, plus the discussion which followed on each paper, are at present being printed in book form and will be available early in January, 1979. It promises to be a most valuable volume to all persons associated with the dairy industry, either as students, milk producers, technologists, animal scientists, manufacturers, scientists or veterinarians.

The price of the Proceedings is R10 per copy. Interested persons are advised to timeously place their orders with the S.A. Veterinary Assn, P.O. Box 26498, Arcadia. 0007; no guarantee can be given that orders received late will be executed.

VEEARTSENYKUNDIGE WOORDEBOEK
VETERINARY SCIENCE DICTIONARY

Waar die SAVV in 1978 'n mylpaal in sy geskiedenis vier, is dit 'n gelukkige sameval van omstandighede dat ook in hierdie maand en jaar die Veeartsenykundige Woordeboek op 'n eenvoudige maar gepaste plegtigheid in die Konferensiekamer van die Vaktaalburo van die Departement van Nasionale Opvoeding op 11 Augustus, 1978, vrygestel kon word. Die funksie is bygewoon deur dr H.S. Steyn, Direkteur van Universiteitsaangeleenthede; dr D.L.E. Laubscher, Direkteur van die Vaktaalburo; mnr S.J. de Jongh, Redakteur van die Woordeboek – al die here van die Departement van Nasionale Opvoeding; prof. B.C. Jansen, Hoofdirekteur, Veeartsenydienste, Veeteelt en Suiwelkunde, Departement Landboutegniese Dienste; prof. C.F.B. Hofmeyr, Dekaan van die Fakulteit Veeartsenykunde van die Universiteit van Pretoria; en ander verteenwoordigers van hierdie instansies. Die toespraak deur dr Steyn by offisiële ontvangs van 'n eksemplaar van die Woordeboek gelewer, is elders in hierdie uitgawe opgeneem. In sy informele redevoering by ontvangs van sy kopie het prof. Jansen uitgebrei op die stellings van dr Steyn.

Ook hierdie gebeurtenis is een wat 'n lang pad geloop en een waaraan baie mense deelgeneem het. Ter aanvulling van dr Steyn se toespraak, kan die voorgeskiedenis kortliks in oorsig geneem word.

Tot en met die eerste dekade van hierdie eeu was veeartse in Suid-Afrika oorwegend Engelssprekend, uit Groot Brittanje of in enkele gevalle uit sy destydse kolonies afkomstig, met 'n paar luisterryke verteenwoordigers uit Switserland en Duitsland. Die eerste Afrikaanssprekendes het hulle in die loop van die tweede dekade oorsee bekwaam, te wete P.R. Viljoen, G. van de Wall de Kock, P.J. du Toit, P.J.J. Fourie, M.W. Henning, L.N. Devenish, B. van de Vijver, C.P. Neser, G.H. Melck, B.J. Brümmer (gebore 5 April 1889, vandag die oudste lewende lid van die professie en van die SAVV, destyds die enigste wat te Utrecht, Nederland, afgestudeer het, en wel in 1915), en A.G. Martinaglia (Italiaans van herkoms maar as weeskind in die Langlaagteweeshuis groot geword en te Cornell afgestudeer).

Eers met stigting van ons eie Fakulteit in 1920 het Afrikaanssprekendes in noemenswaardige en toene-

Ontvangsname van die Veeartsenykundige Woordeboek. Van links na regs: dr D.L.E. Laubscher, prof. B.C. Jansen, dr H.S. Steyn. Foto: Dept. Landbou-Tegniese Dienste.

mende getalle tot die professie toegetree. 'n Paar, soos S.W.J. van Rensburg, C.J. van Heerden en D.G. Steyn was toe reeds besig om oorsee af te studeer, of het agterna gegaan. Die woelinge op die kampus van die destydse Transvaalse Universiteitskollege om gelykberegtiging van Afrikaans, veral in die laat twintiger- en vroeë dertigerjare, het skynbaar geen noemenswaardige weerklank in die afgesonderde Fakulteit Veeartsenykunde gehad nie. Die geweldige praktiese uitdagings wat die veeartsenykundige professie in Suid-Afrika in die gesig gestaar het, diersiekteprobleme enersyds, die stryd om openbare erkenning andersyds, het die geledere van die klein bende heg gesluit en min ruimte vir ideologiese oorwegings gelaat. Slegs die 50-50 taalbeleid, wat in teorie in 1930 vir die Universiteit bevestig is maar in die praktyk nie ten volle uitgevoer is nie, is deur die Fakulteit Veeartsenykunde oorgeërf. Na Afrikaanswording van die Universiteit sou hierdie beleid om vanselfsprekende redes as staatserkende offisiële beleid vir die Fakulteit geld, soos vandag nog die geval is.

In die uitvoer van dié beleid was die gebrek aan Afrikaanse vakterminologie 'n ernstige struikelblok, wat elke dosent maar met swoeg, sweet en vindingrykheid moes oorkom, en, laat dit ter ere gesê word, in goeie gees probeer oorkom het. Daar kan in die geheue teruggeroep word hoe hard 'n man soos wyle prof. H.H. Curson – 'n Engelssprekende in murg en been – geworstel het om lesings in Histologie in Afrikaanse te gee, hoe wyle prof. C. Jackson, met sy perfeksionisme, en later ook wyle prof. R. Clark, hul Afrikaanssprekende kollega's amper tot raserny gedryf het aleer hulle tevrede was dat byvoorbeeld 'n vraestel in suiwer Afrikaans weergegee is. Curson was waarskynlik die eerste wat met 'n Engels-Afrikaanse woordelys op indekskaarte begin het. Sy houding het ongetwyfeld onder sy studente die saad gesaai vir 'n Afrikaanse vakterminologie.

Die voorligtingswerk wat die Afdeling Veeartsenydiens van die destydse Departement Landbou (nou die Department Landboutegniese Dienste) onder boere moes doen, die noodsaak vir sinvolle kommunikasie tussen boer en veearts, en die feit dat die meerderheid boere Afrikaanssprekend was, was 'n verdere groot stukrag. Dit was onvermydelik dat hierdie stukragte mettertyd individue sou opwerp, individue wie se pogings uiteindelik in druk vasgelê sou word. So stel P.J.J. Fourie die eerste voorligtingstuk vir publikasie in die destydse Landboujoernaal in Afrikaans op. Voorheen was alle stukke in Engels opgestel en daarna vertaal. Reeds in 1935 verskyn die „Mediese Woordeboek (met inbegrip van Veeartsenykundige, Tandheelkundige en Hospitaalbenaminge)" aan die hand van F. van der Merwe, assistent geneeskundige skoolinspekteur van Transvaal, en staatsvertaler J.D. Louw. Hierin word erkenning gegee aan lede van ons professie, by name „J.H.R. Bisschop, Veearts te Onderstepoort, en verskeie van sy kollega's, waaronder dr M. (? waarskynlik D.G.) Steyn, wat hulle veel moeite getroos het". Wyle prof. H.O. Mönnig het stil-stil elke vrye oomblik aan sy terminologiekaarte gewy; so kon hy in medewerking met bogenoemde van der Merwe en Louw in 1944 die „Voorlopige Geneeskundige Woordelys" in afgerolde vorm onder beskerming van die Suid-Afrikaanse Akademie die lig laat sien.

Maar die werk het voortgegaan. Manne soos wyle prof. H. Graf het besielend meegewerk en die sweep onder sy jonger kollega's laat klap. Verdere name wat hier genoem moet word is dié van proff. W.O. Neitz en G.C. Drimmelen. Net die noem van enkele name laat nie reg geskied aan die tallose kollega's wat ywerig en geesdriftig saamgewerk het, soms ure lank oor netelige punte gedebatteer het, met of sonder uiteindelike algehele tevredenheid.

Selfs met verskyning van die Veeartsenykundige Woordeboek, wat elders in hierdie uitgawe geresensieer is, is die taak geensins afgehandel nie. Kritiek, voorstelle ter verbetering en aanvulling, en veral navrae in probleemgevalle kan na believe direk aan die Redakteur van die Woordeboek, mnr S.J. de Jongh, Vaktaalburo, Departement van Nasionale Opvoeding, Pretoria, of aan die Redaksie van hierdie Tydskrif gestuur word. By voldoende belangstelling kan 'n terminologierubriek in die Tydskrif ontwikkel word. Hier is 'n taak vir almal.

TOESPRAAK **ADDRESS**

VEEARTSENYKUNDIGE WOORDEBOEK*

H.S. STEYN

Dit doen my groot genoeë om by hierdie geleentheid 'n kort woord tot u te mag rig. Dit is inderdaad 'n besondere geleentheid, en wel in tweërlei opsig. Die woordeboek wat ek nou die eer het om namens die Sekretaris van Nasionale Opvoeding vir verspreiding vry te stel, is die eerste volwaardige vakwoordeboek wat op die gebied van die Veeartsenykunde en Veekunde sy verskyning maak in Engels – Afrikaans en Afrikaans – Engels en is tegelyk ook die eerste vaktaalpublikasie wat onder die vaandel van die Departement se Vaktaalburo die wêreld ingestuur word.

Ter wille van diegene wat dit dalk nog nie weet nie, kan ek terloops net meld dat hierdie Buro teen die einde van 1976 tot stand gekom het met die amalgamasie van die SA Akademie se Vaktaalburo en die Afdeling Terminologie van die Taaldiensburo in 'n nuwe Tak van die Departement waarvoor die naam Vaktaalburo om bekendheids- en gepastheidsredes oorgeneem is. Ek kan ook net byvoeg dat, met hierdie samesmelting, die Departement van Nasionale Opvoeding die grootste gedeelte van ons vaktaalbedryf onder sy vleuels geneem het en nou op die voorpos staan in die koördinering en bevordering van die Afrikaanse en tegelyk ook van die Engelse vaktaalgebruik.

Die beskikbaarstelling van gestandaardiseerde vakterminologie oor die hele linie van die wetenskap en tegnologie is 'n diens wat die Staat, deur die Departement, aan die gemeenskap lewer en hy doen dit graag, binne die finansiële vermoë wat die landsekonomie toelaat. Daar het reeds 'n indrukwekkende lys van vakwoordeboeke en termelyste van die Staat se kant in druk verskyn, benewens 'n hele reeks vakwoordelyste wat *ad hoc* saamgestel en versprei is. Met die Veeartsenykundige Woordeboek sny ons vandag nog 'n kepie in sy kerfstok.

Die verskyning van hierdie woordeboek is die afloop van 'n proses wat reeds in die vyftiger-sestigerjare, nog op die inisiatief van die ou Landboutaalkomitee, aan die gang gesit is.

Die werk kon egter nooit behoorlik vaart kry nie, enersyds omdat die vakkundiges aan wie die taak opgedra was om die terminologie van die verskillende dissiplines van die Veeartsenykunde te versamel, die werk "ter wille van die saak" in hulle afknyptydjies moes doen, en andersyds omdat daar net nie genoeg terminoloë beskikbaar was vir al die terminologieprojekte wat op uitvoering gewag het nie. In die loop van die jare is enkele woordelyste wel deur wetenskaplikes met goeie taalonderlegdheid aan die Veeartsenykundige Instituut te Onderstepoort opgestel, maar die saamstel van 'n verteenwoordigende vakwoordeboek is eers in 1975 met mening aangepak toe mnr. S.J. de Jongh, 'n hoof-taalbeampte van die Vaktaalburo, spesiaal daarvoor afgesonder is. Die feit dat dit gebeur het, is hoofsaaklik aan die idealisme en dryfkrag van een man te danke – prof. H.P.A. de Boom. As hy nie so 'n geesdriftige taalyweraar en uitnemende pleitbesorger vir die ontsluiting van die terminologie van sy vak in Afrikaans was nie, sou die Veeartsenykundige Woordeboek stellig nie vandag hier voor u gelê het nie.

Ewenwel, mnr. De Jongh is in Februarie 1975 na Onderstepoort om die projek in oorleg met die Instituut en die Fakulteit te gaan beplan en programmeer. 'n Besondere woord van dank en waardering kom dr. Weiss en prof. Hofmeyr toe wat die deure vir hom oopgemaak en elke moontlike fasiliteit tot sy beskikking gestel het om hom in die uitvoering van sy taak te help. Eweneens 'n woord van hartlike dank aan al die vakkundiges wat hom met ope arms ontvang en enduit met raad en daad bygestaan het. Mnr. De Jongh het etlike maande lank feitlik voltyds op Onderstepoort gewerk waar selfs 'n eie kantoor en telefoon tot sy beskikking gestel is. Hier kon hy in voortdurende konsultasie met die vakdeskundiges die tersaaklike literatuurbronne ekserpeer en die terminologie van elke dissipline sistematies byeenbring en orden. Met hierdie termeversamelings is hy terug na die Vaktaalburo vir finale afwerking en redaksionele versorging, steeds in oorleg met die betrokke vakdeskundiges. Daarna is die verskillende sublyste in een kaartstel gekonsolideer en omgeskakel en is die teks persklaar gemaak. Dr Jansen het goedgunstiglik ingewillig om die voorwoord te skryf. Ons sê aan hom baie dankie daarvoor. Hartlik dankie ook aan mev. Vermeulen en mev. Brown vir hulle aandeel in die redigeer- en proefleeswerk.

Hierdie woordeboek kan tereg daarop aanspraak maak dat hy die vrug is van die allernouste skakeling en samewerking tussen die vakman en die terminoloog. Trouens, as daar ooit 'n woordeboek gemaak is waar die vakman en die taalman van die begin tot die end hulle kennis verpoel en in een tuig saamgetrek het, dan is dit hierdie een. En waar daar soveel welwillendheid, wedersydse agting en vertroue heers, word die moeilike en moeisame taak van woordeboekmaak vir samesteller *en* medewerker 'n genotvolle en verrykende avontuur en kan die eindproduk nie anders as goed wees nie.

Die woordeboek is saamgestel met die oog op die basiese terminologiebehoeftes van almal wat hulle op die gebied van die Veeartsenykunde en die Veekunde beweeg – die dosent, die student, die navorser, die praktisyn en, les bes, ook die boer. Van die boer gepraat: 'n mens wonder hoeveel van die raak, beskrywende terme in hierdie werk, veral op die gebied van veesiektes en plantname, hulle oorsprong in die vindingrykheid en gevatheid van ons boeregemeenskap het! Maar hierdie werk is nie net vir die veeartsenykundige en die veekundige 'n onmisbare stuk gereedskap

*Toespraak gelewer deur dr H.S. STEYN, Direkteur van Universiteitsaangeleenthede, Departement van Nasionale Opvoeding, by geleentheid van die amptelike vrystelling van die woordeboek op Vrydag, 11 Augustus 1978.

nie. Ook die medikus, die dierkundige en die farmaseut sal met groot vrug daarvan gebruik kan maak. Mens en dier staan wat vorm en inhoud en bekwaaldhede betref, per slot van sake baie na aan mekaar. Aan al hierdie vakkringe dan word hierdie netjies en goedversorgde publikasie aangebied in die vertroue dat hulle nie net daarvan kennis sal neem nie maar dit sal aanskaf en gebruik om so 'n algemeen erkende en eenvormige terminologiese gebruik in hierdie kennisveld te bevorder.

Die Departement en die Vaktaalburo is trots daarop dat hulle, in vennootskap met Onderstepoort, die Departement van Landboutegniese Dienste en die Universiteit van Pretoria, die termeskat van hierdie baie belangrike vakkundige kennisgebied in Afrikaans kon help ontsluit. Hiermee kry die wetenskaplike nou 'n instrument in die hand wat, ons hoop, hom sal aanspoor en help om die groot leemte wat daar nog in die Afrikaanse vakliteratuur op hierdie gebied bestaan, aan te vul. Ons aller dank aan mnr. De Jongh wat die leeue-aandeel in die skepping daarvan geneem en hierdie pragwerk met aansteeklike geesdrif en toewyding in rekordtyd saamgestel en op die pers besorg het.

In hierdie tyd van toenemende kostestyging is die prys van R9,00 waarteen hierdie werk te koop aangebied word, beslis baie billik. Dit is R9,00 goed belê en ons hoop dat die oplaag van 1 000 eksemplare baie gou te klein sal blyk te wees.

Die Veeartsenykundige Woordeboek is regstreeks verkrygbaar van die Staatsdrukker in Pretoria en sal ook in die algemene boekhandel te koop wees.

Die werk beslaan sowat 28 000 inskrywings in Engels en Afrikaans en verryk ons Afrikaanse vaktaalskat met ruim 14 000 terme. En wat meer gepas kan 'n mens verlang as dat ons hierdie nuwe mylpaal in die ontplooiing van die Afrikaanse vaktaal juis nou kan plant waar die Veeartsenkyndige Vereniging van Suid-Afrika sy 75ste bestaansjaar vier en op die oomblik in kongres is hier in Pretoria.

BOOK REVIEW — BOEKRESENSIE

VEEARTSENYKUNDIGE WOORDEBOEK – VETERINARY SCIENCE DICTIONARY

VAKTAALBURO
(Dept. Nasionale Opvoeding)

TERMINOLOGY BUREAU
(Dept. of National Education)

Staatsdrukker, P. Sak X85, 0001 Pretoria – Government Printer, P/Bag X85, 0001 Pretoria, 1978.
pp. xiii + 351, R9,00

This invaluable Afrikaans-English and English-Afrikaans dictionary of terms used in Veterinary Science was compiled under the editorship of Mr. S.J. de Jongh who acknowledges the help he received from numerous persons, in particular those engaged in research and teaching at the Veterinary Research Institute and the Faculty of Veterinary Science of the University of Pretoria, both situated at Onderstepoort. If one name is to be singled out it would be appropriate to mention Prof. (Emeritus) H.P.A. de Boom. The Editor and his colleagues are indeed to be congratulated on the results of many years of dedicated work. This dictionary fulfils a long felt need and will undoubtedly also be used beyond the borders of the Republic of South Africa.

The ability of our farmers to embody the characteristic features of a disease in a name is well known and this features prominently in the dictionary. Equally evident is the knack of creating words to describe, in typical Afrikaans, conditions which are better known in English or Latin e.g. *ingewandsdwaalwurm* for *visceral larva migrans*.

While it would perhaps be presumptuous for a veterinarian to criticise the work of persons with obvious literary training and ability, it is nevertheless regrettable that the English spelling of words traditionally using *ae* and *oe* has been Americanised so that we need to look for *estrus* and *cecum* instead. The foreword does, however, emphasise that both spelling forms are permissible. In looking up the obvious word in a dictionary of this kind it is also disappointing to note that *diergeneeskundig* is not given as one of the words equivalent to *veterinary*. The word *veeartseny* does not appear at all. This shorter word could well be used more widely instead of *veeartsenykundige (veterinary)*, e.g. as *veeartsenyberoep* instead of *veeartsenykundige beroep*.

It is noted with concern that, in the translation of words such as "brucellosis" and "brucellin", the fact that the words are derived from the name of a man called 'Bruce' has been forgotten, so that the Afrikaans equivalents are given as 'brusellose' and 'brusellien'. It is to be hoped that readers of the "Woordeboek" and the Terminology Bureau will recognise this fault and correct this unfortunate situation before 'brusellose', etc., become generally accepted because of custom and usage.

This is the first edition and no doubt the dynamic nature of the veterinary profession and the Afrikaans language will necessitate revision and amplification in time to come. In the meantime it remains a book essential to those who read and write Afrikaans and who are anxious to use the best and correct terminology so as to achieve clarity and brevity of expression. Mr de Jongh and his coworkers deserve our sincere gratitude and compliments for the monumental work.

The book is well printed on good paper and bound in a hard cover.

L.W. v.d. H.

DIE SUID-AFRIKAANSE MILITÊRE VEEARTSENYDIENS*

DOKUMENTASIEDIENSTE, S.A. WEERMAG

ABSTRACT: Documentation Services, South African Defence Force. **The South African Army Veterinary Services.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 299–308 (Afr) Private Bag X175, 0001 Pretoria, Rep. of South Africa.

The history of the South African Military Veterinary Services is outlined from the time the first veterinarian, Thomas Burrowes, attached to the 8th Light Dragoons, set foot in the Cape in 1799, until the end of World War II. It summarises the extensive literature published mainly by Curson in previous issues of this Journal and extends it to include the period of that war.

INLEIDING

Die ontstaan en ontwikkeling van professionele veeartsenykunde in Suid-Afrika was aanvanklik suiwer militêr van aard; dit kan teruggevoer word na die Britse besetting van die Kaap in 1795. Dit is onwaarskynlik dat die Hollandse bewind aan die Kaap veeartse in diens gehad het, daar die Utrechtse Veeartsenyskool eers in 1821 gestig is[4].

PERIODE VOOR DIE EERSTE WÊRELDOORLOG

Ontwikkeling in Brittanje

Die aanstelling van veeartse in die Britse Leër is in 1796 aanbeveel. Voor die datum was dit die kwartiermeester van elke troepemag se taak om die diere te versorg. Die *Army Veterinary Department* het in 1881 tot stand gekom, en die *Remount Department* in 1887. Die posisie van die militêre veearts het geleidelik verbeter totdat hulle dieselfde status geniet het as hulle mediese en vegtende kollegas[4 8].

In 1883 het die *Army Veterinary Department* vir die eerste keer 'n eie uniform gekry. Die broek en tuniek was blou, met 'n maroen kraag en mouboordjies. Hierby is 'n wit lyfband en swaardskede gedra. 'n Rooi veer is op die opgeslane hoed gedra[6].

Ontwikkeling in Suid-Afrika

Ten tye van die Eerst Britse Besetting van die Kaap in 1795 was epidemiese siektes onder die plaaslike diere nog onbekend. Die algemeenste perdesiekte was droes. Die eerste veearts aan die Kaap was Thomas Burrowes wat in 1799 met sy eenheid, die *8th Light Dragoons,* aan die Kaap geland het[4].

Tydens die Bataafse bewind (1803-06) was daar ongeveer 200 tot 300 dragonders aan die Kaap gestasioneer, waarskynlik sonder 'n veearts[4].

Na 1806, met die Tweede Britse Besetting, was daar heelwat meer berede eenhede aan die Kaap teenwoordig, hoofsaaklik as gevolg van die Grensoorloë. Veeartse het heelwat van die veldtogte meegemaak. In die ernstige epidemie van perdesiekte, wat in 1854/55 aan die Kaap uitgebreek het, het 65 000 diere gevrek[4].

Vyf offisiere van die *Army Veterinary Department* en drie addisionele veeartse het sir Charles Warren in 1885 bygestaan tydens die Betsjoeanaland-ekspedisie. Twintig hoefsmede is van Engeland oorgestuur vir die veldtog. 'n Nuwe soort hoefyster, waarmee perde warm of koud beslaan kon word, is suksesvol gebruik. Perdesiekte, miltsiekte en droes het die perde en muile afgemaai en longsiekte die osse[8].

In Natal het die eerste twee militêre veeartse in 1878 hulle verskyning gemaak. Hulle was Francois Duck en B.L. Glover. Perdesiekte, miltsiekte en droes het onder die diere van Natal voorgekom. Tydens die Zulu oorlog van 1879 het die *Army Veterinary Department* vir die eerste keer as sodanig in oorlog gefunksioneer: 15 veeartse het deelgeneem[8].

Dit wil voorkom of daar slegs een veearts aan die Natalse front was tydens die Eerste Vryheidsoorlog, naamlik Gillard van die *15th hussars*[5].

In Transvaal en die Vrystaat het die eerste veeartse eers op 'n laat stadium hulle verskyning gemaak. Duck en Glover was ook die eerste twee veeartse in Transvaal, toe hulle tydens die tweede Sekoekoenie-oorlog in 1878 diens gedoen het. Die volgende jaar het 'n ander veearts van Natal, R. Moore in die derde oorlog as vrywilliger diens gedoen. Sy ondersoek na die hoë tol wat perdesiekte geëis het, is in 1880 in Pretoria gepubliseer. Daar was geen veeartse in die Transvaal tydens die Eerste Vryheidsoorlog nie. Die eerste veeartse in die Vrystaat het met die uitbreek van runderpes in 1897 op die toneel verskyn[5].

*Opgestel op versoek van die SAVV. Briefwisseling met verdere feitestellings en anekdotes word uitgenooi. Red.

*Met uitbreek van die Tweede Vryheidsoorlog was daar waarskynlik 19 veeartsoffisier in die staande mag in Natal en Kaapkolonie, 'n getal wat o.a. deur aanstelling van burgerlikes met verloop van die stryd tot 102 aangegroei het. Daarbenewens was daar 'n tweehonderdtal burgerlike veeartse ook betrokke. Aan Boerekant was daar net Theiler in die Zuid Afrikaansche Republiek en Otto Henning in die Republiek van de Oranje Vrijstaat. Arnold Theiler, wat die rang van luitenant in die Switserse leër beklee het, het by die Boeremagte aangesluit en is benoem tot offisier in die Staatsartillerie (Du Toit & Jackson 1936 Hierdie Tydskrif 7:135). Hy was toegerus met 'n mobiele veldhospitaal, deur muile getrek, en het aan die beleg van Ladysmith deelgeneem. Na die ontset en oorskakeling na guerillaoorlogvoering, het Theiler op eie versoek sy ontslag van genl. Louis Botha gekry en kon hy sy werk by die Daspoortlaboratorium weer opneem (Theiler, Gertrud 1971 *Arnold Theiler 1867-1936: His Life and Times*. Publikasies van die Universiteit van Pretoria, Nuwe Reeks 61. pp. 5-6). Otto Henning, Gouvernements Veearts te Bloemfontein, was saam met die Vrijstaatsche Commando by die beleg van Ladysmith (Theiler, Gertrud 1978 Persoonlike mededeling.) Kol. H. Watkins-Pitchford was in Ladysmith en Frank Verney was met een van die ontsettingskolonne (Theiler, Gertrud 1978 *loc. cit.*). So het die eertydse runderpeskollega's teenoor mekaar te staan gekom. Red.

Met die uitbreek van die Tweede Vryheidsoorlog in 1899 was die Britse veeartsenydienste swak georganiseer*. Vanaf 1899 het die *Army Veterinary Department* onder die *Remount Department* geval. Die Direkteur van *Transport and Supply* in Kaapstad is aangestel as hoof van die *Remount and Veterinary Services.* Veldhospitale is van Indië na Suid-Afrika gestuur. Teen die einde van Mei 1903 was daar 50 veldhospitale en 'n Basis-veeartsenyhospitaal by Elandsfontein. 'n Remontedepot is by Mooirivier in Natal gestig. Die *Army Veterinary Department* se personeel het teen die tyd uit 63 offisier-veeartse, 113 siviele veeartse en 4 371 ander range bestaan. Aan Britse kant is 'n totale verlies van 326 073 perde en 51 399 muile gely[13].

Die *Natal Volunteer Veterinary Corps,* wat in 1899 net voor die uitbreek van die oorlog gestig is, het na die oorlog bly voortbestaan[3]. In 1902, na die Tweede Vryheidsoorlog, is die *Transvaal Volunteers* gestig en regimentsveeartse aangestel. Die *Transvaal Veterinary Corps* is in 1909 gestig[2].

In 1912, met die instelling van die Unie-Verdedigingswet, was daar slegs een offisier-veearts in diens van die Koloniale Staande Mag. Hy was J.B. Collyer, inspekteur en veearts van die *Natal Police.* In 1913 is hy na die Unieverdedigingsmag oorgeplaas en na Engeland vir verdere opleiding by die *Army Veterinary Corps* gestuur. In 1914 is die Veeartsenyhospitaal by Tempe gekoop en Collyer is in bevel van die diere by die Militêre Opleidingskool aldaar geplaas. Die stigting van 'n sentrale Veeartsenyskool by die Veeartsenyhospitaal is aan hom opgedra[9]. Daar is egter nie dadelik vordering gemaak met die organisasie van die Suid-Afrikaanse Veeartsenydiens nie. In sy jaarverslag van 1913 meld die Stafoffisier van Administratiewe Dienste, onder wie veeartseny-aangeleenthede geressorteer het, dat daar nog nie vordering gemaak is met die organisasie nie, en nie voor 1914 daarmee begin sou word nie[14].

EERSTE WÊRELDOORLOG

Stigting en organisasie van die Suid-Afrikaanse Veeartsenydiens (SAVD)

Met die uitbreek van die Eerste Wêreldoorlog het die Staande Magseksie van die Suid-Afrikaanse Veeartsenydiens uit slegs drie lede bestaan. Hulle was kaptein J.B. Collyer, wat toe siek was, een onder-offisier en een siviele stoorman. Daar was slegs 8 000 diere op die sterktetabel.

Die organisasie van 'n veeartsenydiens het op 23 Augustus 1914 'n aanvang geneem, toe kolonel J. Irvine-Smith opdrag ontvang het om in raadgewende hoedanigheid behulpsaam te wees met die organisasie van 'n veeartsenydiens om die ekspedisiemag na Duits-Suidwes-Afrika te vergesel.

Die organisasie het besonder blot verloop. Binne twee ure is die dienste van J.G. Bush, aan wie die tydelike rang van kaptein toegeken is, verkry om kaptein Collyer se pligte oor te neem. Ses bykomende veeartse is aangestel om in Kaapstad by die Unieverdedigingsmag aan te sluit. Verder is reëlings getref om die uitgeputte voorraad medisyne en ander veeartsenyvoorrade aan te vul. Remontedepots is ook gestig.

Irvine-Smith is op 1 September aangestel as Direkteur, Veeartsenydiens van die Unieverdedigingsmag. Op 8 Oktober 1914 is Goewermentskennisgewing no 1714 in die Staatskoerant gepubliseer. Hiervolgens sou die SA Veeartsenydiens uit 'n Staande mag (Staf)-seksie, 'n Burgermagseksie en 'n Vrywilligerseksie bestaan.

Die uitbreek van die Rebellie het die vraag na veeartsenydienste vergroot en die organisasie verhaas. Binne sewe weke is agt basis-veeartsenyhospitale en 15 mobiele veeartsenyseksies gestig en veeartsenypersoneel vir alle berede eenhede, remonte- en vervoerdepots aangestel, asook verskepingspersoneel en lede vir die aankoperade; personeel is opgelei, toegerus en uitgeplaas. Werwing is by die Basis-veeartsenydepot in Booysens, Johannesburg, onder kaptein W.H. Andrews gedoen. Die Veeartsenyvoorrade, wat voor die oorlog by Tempe gestasioneer was, is na Kaapstad verskuif. Die Hoofkwartier van die Suid-Afrikaanse Veeartsenydiens was in Johannesburg gesetel. Binne 'n kort tyd is die aantal diere na 160 000 uitgebrei en die veeartspersoneel na 47 offisier-veeartse, 450 onderoffisiere en 750 Swartes. Die addisionele taak om diere, vleis vir inmaakdoeleindes, en die verwerking van spek te inspekteer, is aan Veeartsenydiens opgedra. Die voer vir diere moes ook geïnspekteer word. Kaptein J.G. Busch is op 13 September as Assistent-direkteur, Veeartsenydiens aangestel.

Vanaf Augustus 1914 tot Januarie 1916 is 65 159 diere deur die Suid-Afrikaanse Veeartsenydiens in hospitale behandel. Hiervan het 6 100 gevrek en 'n verdere 15 862 het gevrek of is van die gras gemaak weens uitputting en siektes. Die totale syfer van 21 926 is uitermate hoog in vergelyking met die van ander leërs in ander veldtogte.

Rebellie en veldtog in Duits-Suidwes-Afrika*

Voor die uitbreek van die Rebellie was no 1, 3, 4 en 5 Veeartsenyhospitale onderskeidelik by Prieska, De Aar, Luderitzbucht en Kaapstad gestasioneer en die basisdepot by Kaapstad. Die uitbreek van die Rebellie het 'n verskuiwing van bestaande mobiele seksies en die stigting van nuwes genoodsaak. No 8 Veeartsenyhospitaal is in Pretoria opgerig. Na die rebellie is no 3 Veeartsenyhospitaal vanaf De Aar na Walvisbaai en no 8 Veeartsenyhospitaal na Swakopmund verksuif. Die Duitse Veeartseny-Instituut by Gamams in Duits-Suidwes Afrika is deur die Suid-Afrikaanse veeartsenydiens beset en 'n groot hoeveelheid waardevolle medisyne en materiaal is verkry. Gedurende die Rebellie en veldtog in Duits-Suidwes-Afrika het die Direkteur, Veeartsenydiens uitgebreide inspeksietoere onderneem om gladde werking van dié diens te verseker.

Die Suid-Afrikaanse Veartsenydiens het hom gedurende die Rebellie en aanvanklike veldtog in Duits-Suidwes goed van sy taak gekwyt. Die Oostelike en Sentrale Magte het tydens die opmars na Duits-Suidwes geringe verliese gely. Doeltreffende voorsorgmaatreëls het verhoed dat diere van die Oostelike Mag tydens die trek deur die miltsiektegebied tussen Kimberley en Kuruman besmet word. Elke eenheid is vergesel van 'n veeartseny-afdeling. Nogtans het die diere se toestand versleg weens gebrek aan voldoende rantsoene. Voor-veeartsenyhospitale is by Kuruman en Boesmansputs gestasioneer. Die Basis-veeartsenyhospitaal van die oostelike Mag was by Kimberley.

Die Sentrale Mag het sy Basishospitaal by Luderitzbucht gehad. 'n Gebrek aan water het tot probleme

*Sien ook Dunning, F.J. 1936. Hierdie Tydskrif 7:7. Red.

gelei. Gekondenseerde seewater en water wat per skip vanaf Kaapstad vervoer is, moes in die behoeftes van die diere voorsien. Vier-en-veertig diere is tot niet gemaak weens droes. Verdere verspreiding van die siekte is deur streng toepassing van die malleintoets afgeweer.

Die Suidelike mag, onder luitenant kolonel Manie Maritz, was op Upington gestasioneer. Majoor Bush, Assistent-direkteur, Veeartsenydiens, het in September opdrag ontvang om hom by Maritz aan te sluit. Ten spyte van 'n aantal siek diere, was die algemene toestand van die diere baie goed.

Gerugte van rebellie het die atmosfeer in die kamp vertroebel. Die Lojaliste het bestaan uit die offisier-veearts, transport-offisier en die maxim-kanonseksie. Met Maritz se vertrek na Van Rooisvlei, is Bush, as senior offisier, in beheer van die kamp by Upington gelaat. Bush het die bevel, wat 'n paar dae later van Maritz gekom het om al die diere onder sy beheer na Van Rooisvlei aan te stuur, verontagsaam. Gedurende die volgende paar weke is Bush geheel en al in vegtende hoedanigheid gebruik. Hy was in bevel van die verdedigingswerke aan die westekant van die dorp. Op 25 Oktober het Bush na Kakamas vertrek om 'n basis-veeartsenyhospitaal op te rig. Die verloop van die Rebellie in die Transvaal en Vrystaat het egter sy planne verydel. Die perde onder sy beheer het koliek en laminitis opgedoen weens die gebruik van koring om hulle voer aan te vul.

Kaptein W.H. Andrews het op 17 November 1914 op Upington met no 1 Veeartsenyhospitaal aangekom. Kort daarna het hy met 'n mobiele veeartsenyseksie na die brigade onder kolonel Bouwer, wat teen generaal Kemp van die Rebelle geveg het vertolk. Die seksie het 'n groot aantal diere gered wat langs die pad deur Kemp sowel as die Lojaliste agtergelaat is. Kaptein D.B.J. McCall is vanaf 23 November in bevel geplaas van die basis-veeartsenyhospitaal, wat op Upington opgerig is.

Na die operasie teen generaal Kemp was die diere in 'n uiters swak kondisie. Die toestand het verder verswak deurdat die diere feitlik op Upington vasgekeer was vanweë die Rebelle se voortdurende teenwoordigheid in die omgewing. Verder het die vol Oranjerivier verhinder dat ratsoene die diere op Upington bereik. Vroeg in Februarie 1915 is die Rebelle tot oorgawe gedwing en kon die diere weer voldoende voer ontvang.

Die 4de Berede brigade, met Mobiele Seksie "F" onder kaptein P.R. Viljoen, het in Maart 1915 by Upington aangekom en voorbereidings is getref vir 'n algemene opmars na Duits-Suidwes-Afrika. Die Suid-Afrikaanse veeartsenydiens is as volg vir die veldtog ingedeel:

Majoor J.G. Bush – Assistent-direkteur, Veeartsenydiens
4de Berede Brigade – Kaptein P.R. Viljoen en 'n mobiele veeartsenyseksie
11de Berede Brigade – Kaptein Strachan en 'n mobiele veeartsenyseksie
Transport – Kaptein Kellett en veeartsenytroepe
Basis-veeartsenyhospitaal, Upington – Kaptein D.B.J. McCall.

Majoor Bush het op 10 Maart op 'n uitgebreide inspeksietoer vanaf Upington vertrek. Droes het onder die diere van die Suidelike Mag uitgebreek, gevolglik het hy opdrag gegee dat alle perde en muile by hulle aankoms op Upington aan die malleintoets onderwerp moes word. Majoor Bush was vanaf 24 November 1915 in bevel van veeartsenydiens op Upington, tot met die sluiting van die basis-veeartsenyhospitaal in Januarie 1916. Tot en met die 16de Januarie 1916 is 25 454 diere hier getoets, waarvan 810 tot niet gemaak moes word. Dieresiektes wat onder die Suidelike Mag voorgekom het, was droes, brandsiekte (1 648 gevalle), miltsiekte (12 gevalle), lymfangitis (5 gevalle), nuwesiekte (459 gevalle), perdesiekte, omloop, piroplasmose (4 gevalle), longontsteking (51 gevalle), sandkoliek (59 gevalle), enteritis, wonde en beserings.

Die eerste gedeelte van die Noordelike Mag, waaronder 2 000 diere, het op 26 Desember 1914 in Walvisbaai geland. Die totale aantal diere wat na Walvisbaai verskeep is, het 43 000 beloop. majoor G.W. Lee is in beheer geplaas van die veeartseny-organisasie vir die verskeping van diere. Streng voorsorgmaatreëls is getref om die welsyn van die diere te verseker.

Drie maande het verloop voor die aanvang van die algmene opmars na die noorde. Tydens die wagtydperk by Walvisbaai en Swakopmund het die diere genoeg water en rantsoene ontvang. Sandkoliek het voorgekom, maar is onder beheer gebring. Ander siektes wat in hierdie tydperk voorgekom het, was longontsteking, nuwesiekte, omloop, perdesiekte, galkoors, influensa, droes, neusslymviesontsteking, purpura, laminitis, mankheid weens gebrekkige hoefysters, en seer rûe.

Met die aanvang van generaal Louis Botha se opmars vanaf Swakopmund, was die diere in 'n uitstekende kondisie. Ten spyte van woestyntoestande en gebrek aan rantsoene, het min vrektes voorgekom. Groot getalle diere het egter weens uitputting uitgeval en is na Karibib teruggestuur.

Ten tye van die Tweede Opmars was verskeie brigades langs die spoorlyn van Usakos na Windhoek gestasioneer. Elke brigade was vergesel van 'n veeartsenyseksie. In die ses weke wat tussen die besetting van Windhoek en die aanvang van die opmars verloop het, is probleme ondervind om voer vanaf die kus na die diere te vervoer. Die diere was gevolglik nie in 'n baie voedingstoestand nie. Ongeveer 10 000 verswakte diere is agtergelaat, 7 000 daarvan in die omgewing van Windhoek. Die diere het aan die Suidelike mag en 3de Brigade behoort. Gebuite Duitse perde het die diere met droes aangesteek.

Die veeartseny-organisasie van die Noordelike Mag was as volg:

Majoor Lee, Assistent-direkteur, Veeartsenydiens, Noordelike Mag, Windhoek
1 Offisier-veearts – Veeartsenyseksie, Windhoek
1 Offisier-veearts – Veeartsenyseksie, Klein-Aukas
1 Basis-veeartsenyhospitaal, Walvisbaai
4 Offisier-Veeartse en Mobiele Seksies by die vier berede Brigades
1 Offisier-veearts – Artillerie
1 Offisier-veearts – *Imperial Light Horse*
1 Offisier-veearts – *Infantry Brigade.*

Op 9 Julie 1915 het die Duitse magte by Khorab naby Otavifontein oorgegee. Die Suid-Afrikaanse troepe is gelas om onmiddellik na die Unie terug te keer en hulle diere agter te laat. Daardie diere moes dan by depots vir hulle terugkeer na die Unie versamel word. Die diere, wat totaal uitgeput was, is oral in die veld agter gelaat waar die mobiele seksies van die Suid-Afrikaanse Veeartsenydiens hulle soms eers 'n week of tien dae later kon bereik. Versamelpunte en konsentrasiekampe vir diere van die Noordelike Mag is by Otavi-

fontein, Kalkfontein, Omaruru, Karibib, Usakos, Klein-Aukas, Okahandja en Windhoek opgerig, en vir die Suidelike Mag by Rehoboth, Keetmanshoop en Kune. Teen daardie tyd was daar ongeveer 60 000 diere in die protektoraat. 'n Onderbreking in spoorwegdienste het katastrofiese gevolge vir die diere gehad. Voer wat per spoor van die kus aangestuur moes word, kon die diere nie bereik nie. Tussen Julie en Oktober 1915 het die diere in groot getalle gevrek of so verswak dat dit maande geneem het voor hulle weer herstel het.

Die Remonte-owerhede het besluit om die diere op plase te versprei waar hulle weiding kon kry, maar die diere was te swak om die afstande af te lê. Duisende het weens honger gevrek en nog duisende moes geskiet word.

In Augustus het die Direkteur begin met 'n inspeksietoer. In Windhoek het hy pogings aangewend om voer by die diere te kry, maar sonder sukses. Dit was die taak van die Remonte-owerhede in die protektoraat om met die diere na die voer by die kus te trek. Die Suid-Afrikaanse Veeartsenydiens het pligsgetrou volhard in hulle stryd om siektes te bekamp – 'n taak wat hulle onder moeilike omstandighede suksesvol uitgevoer het. Ses duisend diere is dood weens honger en siektes. Ook die trekdonkies het onder droes deurgeloop. In sy jaarverslag het die Direkteur die hoogste waardering betuig vir die werksaamhede van die Suid-Afrikaanse Veeartsenydiens in hierdie tyd. Persone wat spesiale vermelding verdien het, is kaptein Joyce van Swakopmund, kaptein Dunning van Windhoek, kaptein Andrews van Kaapstad en kaptein McCall van Kimberley.

Die Direkteur het sy inspeksietog op 27 Augustus by Prieska afgesluit en na Hoofkwartier teruggekeer. Die volgende depots is ontbind: Standerton en Tweespruit se Remonteplase, Tempe, De Aar, Draghoender, Border, Potsdam, Mellih's Farm, Parow, Papkuil Farm, Boesmansputs, Kuruman, Warrenton, Veertienstrome en Kroonstad. Die Basis-veeartsenystoor is van Kaapstad na Johannesburg verskuif.

Op 10 Desember 1915 is afgekondig dat die volgende tydelike Burgermageenhede ingestel is:

Militêre distrik no 1 – No 1 Mobiele Veeartsenyafdeling, SAVD
Militêre distrik no 2 – No 2 Mobiele Veeartsenyafdeling, SAVD
Militêre distrik no 3 – No 3 Mobiele Veeartsenyafdeling, SAVD
Militêre distrikte no 4 en 5 – No 4 Militêre Veeartsenyafdelings, SAVD
Militêre distrik no 6 – No 5 Militêre Veeartsenyafdeling, SAVD
Militêre distrik no 7 – No 6 Mobiele Veeartsenyafdeling, SAVD
Militêre distrik no 8 – Hoofkwartier, SAVD, 1 Veeartsenyafdeling, SAVD.

'n Basiesdepot van veeartsenybenodigdhede onder benaming no 1 Basisdepot, Veeartsenybenodigdhede.

In Januarie 1916 is 'n konferensie op Upington belê om te besluit oor die sluiting van alle remontedepots in Duits-Suidwes-Afrika, en die oorhandiging van 'n veeartseny-, transport- en remonte- organisasie aan die burgerlike owerhede. Op 17 Januarie is die Basis-veeartsenyhospitaal by Upington en op 19 Januarie dié by Kaapstad gesluit. By no 5 Basis-veeartsenyhospitaal in Kaapstad is 'n diptenk opgerig waar daar altesaam 28 432 diere gedip is.

Aan die einde van die veldtog in Duits-Suidwes-Afrika het daar in Suid-Afrika 'n veeartsenydiens bestaan wat nie alleen voldoen het aan die vereistes van die Unieverdedigingsmag nie, maar ten volle vir verdere noodgevalle toegerus was. In Maart 1916, toe kolonel Irvine-Smith uitgetree het, het no 1 Basis-veeartsenyhospitaal, een Basis-depotveeartsenystoor en 12 mobiele veeartsenyseksies vir diens aan die militêre distrikte van Suid-Afrika bestaan. Vanaf 1 Maart 1916 het majoor J.G. Bush, wat tydelik bevorder is tot luitenant-kolonel, by Irvine Smith as Direkteur Veeartsenydiens oorgeneem.

Veldtog in Duits-Oos-Afrika

Drie veeartsenydienste het deel gehad aan die veldtog in Duits-Oos-Afrika, nl. die *East African Veterinary Corps,* die *Army Veterinary Corps* en die Suid-Afrikaanse veeartsenydiens. Teen die einde van die oorlog is die *African Native Veterinary Corps* in Duits-Oos-Afrika georganiseer. Min gegewens is egter oor die aandeel van die SAVD in dié veldtog beskikbaar.

In Augustus 1915 het die SAVD begin om diere vir diens in Oos-Afrika te keur. Muile van die *Nyassaland Mountain Battery* en die SA Veldartillerie is deur die SAVD teen perdesiekte geïmmuniseer. Veeartsenyeenhede, wat opgerig is vir die veldtog in Oos-Afrika, was:

2 basis-veeartsenyhospitale en store
1 basis-veeartsenystoor
1 voorbasis-veeartsenyhospitaal
3 mobiele veeartsenyseksies
Offisier-veeartse en troepe vir vier berede eenhede in die veld
Troepe vir ostransport
Offisier-veearts en troepe vir die *SA Field Artillery*
Offisier-veearts vir die *Mountain Battery Nyassaland.*
Verder is 13 offisiere, 262 ander range en 83 Swartes aangestel.

Drie depots is vir die behoeftes van die Oos-Afrika magte geopen, nl by Robertshoogte, Fort Napier en Durban. Alle perde en muile is voor hulle vertrek na die verskillende depots aan die malleintoets onderwerp, en weer by hulle aankoms in Durban, waarvandaan hulle na Oos-Afrika verskeep is. Vanaf Augustus 1915 tot Maart 1916 is 20 000 diere getoets. Elke transportskip is toegerus met veeartsenypersoneel en -voorrade.

Die aankoperade is van offisier-veeartse voorsien. Vanaf Maart 1916 tot Januarie 1917 is 25 792 perde, 19 595 muile en 21 960 donkies vir die veldtog in Oos-Afrika aangekoop. In hierdie tydperk is veeartsenyhospitale na Kimberley, Potchefstroom, Durban, Pietermaritzburg en Robertshoogte uitgebrei. Die SAVD het ook aandag geskenk aan die beheer van aansteeklike siektes soos droes, miltsiekte, lymfangitis en skurfte.

Die lone van ondergeskikte personeel van die SAVD is by dié van die SA Berede Skutters aangepas. Dierevelle by die depots is gesout om verkoop te word. Offisiere van die SAVD het die slagpale en die spekfabrieke by Nelsruste en Pietersburg geïnspekteer. Die Basis-veeartsenystoor is in September 1916 van Johannesburg na Pretoria verskuif.

Die veeartsenypersoneel in Oos-Afrika het onder beheer van die *East African Veterinary Corps* gestaan.

met kol R.J. Stordy as Direkteur, Veeartsenydiens. Meer as die helfte van die offisierveeartse was egter lede van die SAVD.

Die eerste afdeling Suid-Afrikaanse troepe, waaronder twee basis-veeartsenyhospitale en mobiele Seksie "A", het in Desember 1915 by Kilindi aangekom. Nog dieselfde maand het majoor Cannon met no 2 Basis-veeartsenyhospitaal na Maktua vertrek en die res van die veeartsenypersoneel, met majoor W. Joubert as bevelvoerder en kaptein Howie as tweede-in-bevel, na Kajiado. Hier het kaptein A.M. Howie bevel van die Basis-Veeartsenystoor en veeartsenylinies van die *East African Veterinary Corps* oorgeneem. Die kamp was vuil, maar taamlik goed uitgelê, met drie rye stalle. Howie het op 14 Januarie 1916 na Maktau vertrek om no 2 Basis-veeartsenyhospitaal oor te neem. Op dié stadium was dit die voorste kamp. Eers vroeg in 1917 het Howie na die werklike front verskuif. Nuwe linies is na die Duitse onttrekking gestig.

Die Duitsers het hulle terugval roetes slim beplan volgens raad wat hulle veeartse aan hulle bedien het, roetes wat gekies is om oor die gevaarlikste terreine vir diere te gaan. Waarskynlik die gevaarlikste roete was tussen Korogwe en Morogoro, waar die lewensduurte van 'n rydier hoogstens drie weke was. Hierdie strategie het die Britse opmars in totaal sowat 12 000 perde en muile gekos[12].

Gedurende die tydperk Januarie tot Oktober 1916 is 20 144 perde en muile aan die 2de en 3de Divisies uitgereik, en op 11 Oktober 1916 het Howie vanaf Maktua na Korogwe op die Tanga-Moshi-roete vertrek. Sy personeel en toerusting het uit 32 onder-offisiere en manskappe, 28 Kleurlinge en 123 Oos-Afrikaanse inboorlinge, uit ry- en transportdiere en voorrade bestaan. Weens ongesonde toestande is Howie spoedig sonder 'n groot deel van sy personeel gelaat, wat met malaria in hospitale opgeneem is. Ook moes 260 perde weens tripanosomiase van kant gemaak word.

Die depots by Tanga en Korogwe is gesluit en op 24 Desember 1916 het Howie na Kilwa vertrek. Op 8 Januarie 1917 het hy by Kilwa Kivanja aangekom en twee dae later met ses mans, muile en twee oskarre die ongesonde gebied dieper ingetrek. Twee dae later is Mitole bereik. Die veeartsenypersoneel en diere by die kamp was siek, rantsoene vir diere, sowel as behandeling, was onvoldoende en diere moes werk totdat hulle gevrek of tot niet gemaak is. Ook die inboorlinge, wat vir transportdoeleindes ingespan is, het in hulle duisende omgekom. In Maart 1917 is 'n totaal van 5 012 diere verloor.

Die Assistent-direkteur op Kitamba, majoor Jowett, was siek en is op 20 Februarie deur kaptein Howie vervang. Die toestand was uiters haglik en vrekkende en dooie diere het oral rondgelê.

Die depot by Mohoro is deur swaar reën weggespoel en rantsoene vir die diere was min, gevolglik is daar besluit om na Kilwa terug te keer. Howie is van Kilwa per skip na Dar-es-Salaam. In Oktober 1917 keer hy terug na Kilwa en in Maart 1918 na Suid-Afrika. Van die twee offisier-veeartse en 135 ander range wat onder Howie was, het net Howie en vier ander range teruggekeer. Die verlies aan dierelewens tydens die veldtog in Oos-Afrika was buitensporing hoog, selfs in vergelyking met dié van die veldtog in Duits-Suidwes-Afrika. Die volgende syfers toon die verlies aan perde, muile en donkies[10].

	Totale aantal diere gebruik	Totaal teen einde van oorlog
Perde:	31 000	827
Muile:	33 000	897
Donkies:	34 000	1 402

Hierteenoor was die behandeling van diere in die Unie besonder geslaagd. Die hospitaalstatistieke van diere wat by die depots by Kimberley, Robertshoogte (nou Voortrekkerhoogte), Potchefstroom, Pietermaritzburg en Durban behandel is, is as volg:[10]

	Gevalle Toegelaat	Dood en Doodgemaak	Ontslaan
Perde	16 734	806	15 914
Muile	3 777	161	3 613
Donkies	4 067	312	3 755

Die hoë tol wat siektes aan dierelewens in Oos-Afrika geëis het, kan hoofsaaklik aan die tsetsevlieg toegeskryf word. Min was bekend oor veeartsenytoestande in die operasionele gebied in Oos-Afrika. Al oplossing onder omstandighede was om die gebruik van perde in die tsetsevlieggebiede tot 'n minimum te beperk. Dié beleid was vanaf Maart 1916 nie meer uitvoerbaar nie, en diereverliese het tot 100 % gestyg.

Ander probleme waarmee die veeartsenydiens te kampe gehad het, was die ongeskiktheid van die weiveld in die gebiede waardeur die diere getrek het. Daarbenewens het die ruiters en persone wat met die perde se versorging te doene gehad het, weens die meganisasieproses nie meer oor eersterangse kennis van die hantering van ryperde beskik nie. Ook is daar in baie gevalle nie aandag aan die raad van veeartsenypersoneel geskenk nie. Metodes wat aangewend is om die diere in die tsetsegebiede te beskerm was om in die nag te trek, die slagvee agter in die kolonne te plaas, in oop ruimtes te wei, die gras op die rivierwalle af te brand en uitwendige middels te gebruik. In die noordelike streke van Duits-Oos-Afrika het perdesiekte voorgekom. Die oprigting van depots weg van die kus, rookvure, uitroei van insektebroeiplekke, oprigting van kampe en depots op veilige plekke, en die gebruik van voersakke, is van die metodes wat gebruik is om diere teen die siekte te beskerm. Ander siektes wat voorgekom het, is runderpes, Ooskuskoors en miltsiekte[1].

Die volgende toekennings is deur lede van die Suid-Afrikaanse Veeartsenydiens ontvang:

OBE: Kaptein H.E. Hornby en kaptein A.M. Howie

DSO: Majoor J.G. Busch

MC: Kaptein T.E.M. Jarvis en kaptein C.H. Wadlow

MSM: Sersant-majoor F.G. Andrews, vlugsersant E. Dawson, sersant-majoor T.W. Johnson, staf-sersant W.C. Papenfus, staf-sersant S. Walker[10].

TUSSEN-OORLOGSE TYDPERK

In die tydperk tussen die twee wêreldoorloë het die gebruik van diere in die Unie-Verdedigingsmag afgeneem. Waar daar in 1919 twee offisier-veeartse in beheer van die meer as 1 600 diere by Robertshoogte en die Artilleriebarakke was, het die hele veeartsenypersoneel van die SAVD met die uitbreek van die Tweede Wêreldoorlog in 1939 uit slegs een offisier-veearts, majoor W.S.B. Clapham, en nege ander lede bestaan. Daar was slegs 40 ponies vir vermaaklikheidsdoel-

eindes en 'n aantal transportmuile en artillerieperde op die sterktetabel.

In die twintigerjare is die Unie-Verdedigingsmag gereorganiseer, met behoud van die SAVD (Staande mag – SM – en aktiewe Burgermag – ABM). In 1926 is die militêre distrikte van die Unie van 15 na ses verminder, die SA Berede Skutters is ontbind en die berede artillerie verander na veldartillerie. Die meganisasiebeleid van die dertigerjare het tot 'n verdere afname in die gebruik van diere in militêre verband gelei[11].

In 1920 het die Mediese en Veeartsenyvoorrade saamgesmelt om die Sentrale Mediese en Veeartsenydepot te vorm. In 1922 is besluit om die voorrade saam te laat funksioneer tot in geval van oorlog. Die SAVD het onder die Kwartiermeester-generaal (KMG) geval[15].

In 1921 het majoor Collyer afgetree en is deur luitenant-kolonel J.G. Bush as waarnemende Direkteur, Veeartsenydiens opgevolg[11]. Hoefsmidkursusse is in 1922-3 deur die SAVD by die Veeartsenyhospitaal, Robertshoogte ingestel en vier kandidate het in die eerste kursus geslaag[16]. Die veeartsenyhospitaal by Voortrekkerhoogte is in 1926 gesluit en die personeel na SA Dienskorps vir diens by die Transportdepot oorgeplaas. Siek diere moes in die toekoms in die eenheidslinies behandel word[11]. Die stigting van no 1 Veeartsenyhospitaal (ABM) is in dieselfde jaar gemagtig[17]. In 1927 is die Eerste Mobiele Veeartsenyseksie by Pietermaritzburg gestig en in 1931 na Onderstepoort verskuif. Beide eenhede is in 1936 ontbind[18 19]. Kapteins J.H.R. Bisschop en J.I. Quin se bedankings was grootliks verantwoordelik vir die ontbinding van die eenhede, aangesien Onderstepoort nie meer die opleiding van die eenhede kon behartig nie en geskikte plaasvervangers nie gevind kon word nie. Die meganisasiebeleid het verder tot die ontbinding bygedra.

Luitenant-kolonel Bush het op 31 Mei 1931 as Direkteur, Veeartsenydiens afgetree en is deur kaptein W.S.B. Clapham as offisier-veearts opgevolg. Clapham is in September 1939 op die Reserwelys geplaas[11].

Reeds in April 1939 is op 'n vergadering oor die reorganisasie van die SAVD besluit om dr P.J. du Toit en dr. G.V. d. W. de Kock aan te stel as Direkteur en Adjunk-direkteur, Veeartsenydiens (ABM) onderskeidelik. Beide het dit egter as voorwaarde gestel dat offisier-veeartse van die Staande mag dieselfde professionele toelaag as mediese offisiere moes ontvang. Op dieselfde vergadering is ook oor die stigting van 'n ABM eenheid te Onderstepoort, genoem "A" Kompanie, ooreengekom.

TWEEDE WÊRELDOORLOG

Met die uitbreek van die Tweede Wêreldoorlog in September 1939, was die Direktoraat, Veeartsenydiens nog nie ingestel nie en is stappe onmiddellik geneem om die direktoraat te stig. Op 4 Augustus is kolonel P.J. du Toit aangestel as Direkteur, Veeartsenydiens en luitenant-kolonel G. V. d. W. de Kock as Adjunk-direkteur. Beide was lede van die ABM en kon nie hulle aandag aan militêre veeartsenysake skenk nie. Majoor A.M. Howie het kaptein Clapham opgevolg as offisier-veearts en die SAVD is onder beheer van die KMG-afdeling geplaas.

Die eerste stap na die aanstelling van die direkteure was die instelling van "A" Kompanie, SAVD (ABM) op 1 September 1939[20]. Die eenheid sou bestaan uit 'n hoofkwartier en vier seksies, maar het in werklikheid nie tot stand gekom voor die aanstelling van kapteins R.A. Alexander en H.P. Steyn van Onderstepoort in Maart 1941 nie. Dié eenheid is op 15 Augustus 1943 ontbind.

Depot Kie, SAVD (ABM) is op 1 April 1940 opgerig en toegewys aan Kommandement Voortrekkerhoogte en Transvaal[21]. No 1 en 2 Veeartsenyhospitaalseksies is in September 1939 gestig en by Standerton-Remontedepot gestasioneer. No 3 Hospitaalseksie is by Ladysmith opgerig, met 15 November 1940 as stigtingsdatum.

Die personeel van die SAVD het vinnig uitgebrei en in Mei 1940 was daar reeds 'n totaal van 425 lede. Vroeg in 1940 is besluit om die Adjunk-direkteur, luitenant-kolonel De Kock, oor te plaas na die Reserwe en luitenant-kolonel C.J. van Heerden in sy plek aan te stel. Majoor A.M. Howie van die Staande Mag is as Assistent-direkteur, Veeartsenydiens aangestel. In Desember 1940 is die addisionele taak van vleis- en melkinspeksie ook aan die Direktoraat opgedra. Vier motorambulanse is ook verkry.

Met die besluit om 'n berede divisie in die Unie op te rig, het die instelling van 'n Direktoraat, Remontediens noodsaaklik geword. Luitenant-kolonel J.G. Bush is in Februarie 1940 aangestel as Assistent-direkteur, Transport (Diere) en later dieselfde jaar as Direkteur, Remontediens. Aankoperade is aangestel en remontedepots te Voortrekkerhoogte (voorheen bekend as Robertshoogte), Standerton en Ladysmith opgerig. Die depot by Voortrekkerhoogte is in November 1940 na Mooiplaas op die Krugersdorppad verskuif. Weidingsplase is later by Andulusia en Vaalhartz ingestel. Die aankope van perde het in Junie 1940 'n aanvang geneem. Op elke aankoperaad het 'n offisier-veearts gedien*. Perde en muile is aan die 1st Berede Kommandodivisie by Ladysmith, die Suid-Afrikaanse Geniekorps, 1ste Mortierpakbattery en die SA Seinkorps uitgereik. Aanvullend tot die verskaffing van diere aan die Unieverdedigingsmag (UVM), is die Remontediens ook versoek om perde, muile en donkies aan die Britse en geallieerde magte te verskaf. Op 15 Maart 1941 is 20 muile na Oos-Afrika verskeep. 'n Bestelling is van die Griekse leër ontvang, maar voor dit uitgevoer kon word, het die Griekse regering tot 'n val gekom. Bestellings uit die Midde-Ooste en Indië is egter uitgevoer.

Die pligte van die Direktoraat, Veeartsenydiens het die volgende behels: die verskaffing van offisier-veeartse en hoefsmede vir aankoperade, ondersoek, immunisering, hospitalisasie en beslaan van perde. In die algemeen was die Direktoraat verantwoordelik vir die algemene welsyn van diere, vervoer van siek diere,

*Asook een of twee hoefsmede en remontepersoneel. Remonte is volgens militêre spesifikasies gekeur en pryse volgens verdedigingsmagstipulasies aan boere en perdehandelaars betaal, wat hul diere in antwoord op uitgebreide advertensies na bepaalde aankooppunte – gewoonlik 'n spoorwegsylyn – gebring het. Nommers is op die linkerboud en linkerhoef gebrand en op die tandvleis getatoeëer. Die Weermag het bykans 90 % van die perde van die S.A. Polisie, wat oor 'n remontekamp te Kamferdam en oor 'n teelplaas beskik het, oorgeneem. Die bekende perdeteler, Solly Diamond, het ook 'n aansienlike deel van die perde verskaf. Persoonlike mededeling: AO I.W. Paulsen. (Hy was vanaf Februarie 1941 aan die S.A. Mortierpakbattery van die S.A. Berede Brigade te Ladysmith verbonde en het diens in Madagaskar gedoen. Vanaf November 1941 tot Februarie 1942 was hy verbonde aan die SAVD.

veeartsenystore en toerusting en oprigting van stalle vir veeartseny-eenhede.

Oorsig van werksaamhede van die Direktoraat in die Unie

Depot Kie (V), SAVD was op Voortrekkerhoogte gestasioneer en was verantwoordelik vir die opleiding van veeartsenypersoneel en hoefsmede**. Kaptein A.R. Thiel was die bevelvoerder en kaptein H.H. Curson in bevel van die Kleurlingseksie was as hoefbeslaners en staljongens opgelei is. Die eerste remontedepot is in 1940 op Voortrekkerhoogte opgerig. Die diere van die depot is deur Depot Kie as opleidingsmateriaal gebruik. In 1940 was die gemiddelde maandelikse sterkte van Depot Kie meer as 300 lede. In dieselfde jaar is 561 perde en muile behandel. 'n Epidemie van nuwesiekte het onder die diere uitgebreek en van September tot Desember 1940 is 273 gevalle behandel.

In 1941 is 307 algemene gevalle tot Depot Kie toegelaat. Die maandelikse personeelsterkte was 260. Binne vyf maande is meer as 7 000 diere se reeksnommers op hulle tandvleise getatoeër. Depot Kie was in die jaar ook behulpsaam met die opleiding van lede van die eerste Veldeskadron (Berede) van die Suid-Afrikaanse Geniekorps. Een offisier-veearts en 13 ander range het die eksadron na Ladysmith vergesel.

No 4 Dieretransport-subdepot is in 1942 by Voortrekkerhoogte gestig met ongeveer 300 transportdiere. Depot Kie het omgesien na die welstand van die diere en het die personeel geadministreer. In September is Depot Kie se naam verander na no 1 Reserwe Personeelopleidingsdepot (V), SAVD en no 1 Veeartsenyhospitaal (V), SAVD. In November 1942 is die eenheid amptelik ontbind.

No 1 en no 2 Hospitaalseksies (V), SAVD moes die Hoofremontedepot, wat op 1 Augustus 1940 by Standerton gestig is, bedien. Majoor L.L. Daly was in bevel. Die volgende jaar is hy deur kaptein J.W.A. Brookes opgevolg. Die twee hospitaalseksies het gedurende hulle bestaanstydperk heelwat probleme ondervind om voldoende personeel te verkry. Betrekkinge met die Remontedepot is vertroebel toe die hospitaalseksies ondergeskik gestel is aan dié depot. As gevolg hiervan het die administrasie, veral aan die begin, nie na wense verloop nie. Gevalle van nuwesiekte, brandsiekte, koliek, oftalmie, longontsteking en beserings is daar behandel. Met die ontbinding van die Berede Divisie in 1942 het die twee hospitaalseksies oorbodig geword en is op 30 September 1942 ontbind.

In November 1942 is die SAVD in 'n Hoofkwartier in Pretoria, no 1 Veeartsenyhospitaal, Voortrekkerhoogte, en no 2 Veeartsenyhospitaal, Standerton gereorganiseer. Die hoefbeslaanpersoneel van no 1 Remontedepot is by die personeel van no 2 Veeartsenyhospitaal gevoeg. No 2 Veeartsenyhospitaal was op Standerton gestasioneer tot met die ontbinding van no 1 Remontedepot in Desember 1943. Op 9 Desember is die hospitaal oorgeplaas na Premiermyn om no 1 Dieretransportdepot te bedien.

No 3 Veeartsenyhospitaalseksie (V), SAVD is op 18 September 1940 by Ladysmith in Natal gestig met kaptein W.G. Barnard as bevelvoerder. Die personeel het uit 32 lede bestaan. Die Eerste Berede Kommandodivisie onder brigadier-generaal H.N.W. Botha is by Piet Retief opgelei en vanaf Januarie 1941 by Ladysmith gestasioneer. Die eerste besending van 1 197 perde is op 19 September, die dag na die stigting van die hospitaalseksie, na Ladysmith gestuur*. Dit het 'n groot las op no 3 Hospitaalseksie geplaas. Later dieselfde maand is die getal perde na 'n totaal van 1 919 vermeerder. Die hospitaalseksie was nie ingerig om so 'n groot hoeveelheid te hanteer nie, en die personeel het slegs uit hoefsmede bestaan.

In Januarie 1941 is die oorblywende lede van die 1ste, 2de, 3de, 4de en 6de Berede Kommando-Regimente verander in die nuwe 1ste, 2de en 3de Berede Kommando-Regimente en veeartsenypersoneel is by die regimente gevolg. In dié jaar het 'n epidemie van perdesiekte uitgebreek. Die diere is egter die vorige tien maande geïmmuniseer en min skade is gely**. Ten spyte van die omstandighede waaronder hulle moes werk, het die personeel van no 3 Veeartsenyhospitaalseksie hulle goed van hulle taak gekwyt. Op 13 September 1941 is die seksie gesluit. Die bevelvoerders was kaptein Barnard (twee keer), kaptein M.C. Robinson en kaptein J.L. Dickson. 'n Totaal van 1 689 gevalle is hier behandel.

Vanaf Junie 1940, met die vorming van ses berede eenhede, was die SAVD verantwoordelik vir die versorging en beslaan van perde van dié eenhede, die remontedepots en loopgraafmortier-pakbatterye. Soos vermeld (P 304) was die Mediese en Veeartsenyvoorrade lank voor die oorlog onder die benaming Sentrale Mediese en Veeartsenyvoorrade gekombineer. Op 4 Februarie 1941 is Basis-veeartsenyvoorrade onder beheer van die Adjunk-direkteur, Veeartsenydiens op Voortrekkerhoogte gestig. Met die aanstelling van 'n kwartiermeester, luitenant Steenkamp, en 'n assistent, in 1942, is die voorrade direk vanaf Voortrekkerhoogte beheer. Die vernaamste funsies van die eenheid was die verskaffing van medisyne en benodigdhede aan veeartsenyhospitaalseksies en remontedepots, asook aan berede eenhede en diere wat na Mombasa, die Midde-Ooste en Indië verskeep is. Toerusting vir die vleis- en melkinspekteurs het ook van Veeartsenyvoorrade gekom; dié afdeling het na die samesmelting van Veeartseny- en Remontedienste in 1942 bly voortbestaan.

**Weens die algemene tekort aan hoefsmede, is etlike oudgediendes van die Britse kavallerie uit die Tweede Vryheidsoorlog, manne om en by hul sestigerjare, gerekruteer. AO I.W. Paulsen, Weermagskollege, Voortrekkerhoogte.

*Hulle is na die remontekamp by Dragoon Hill by die buitewyke van Ladysmith geneem. AO Paulsen.

**Volgens AO Paulsen was die sterftesyfer aan perdesiekte gedurende 1940 ongeveer 1 000, gedurende 1941 ongeveer 700 en in 1942 om en by 300. Etlike sterftes a
aangesien die suiping by 'n rivier naby die kamp was. No 3 Hospitaalseksie het dag en nag gewerk om sand per hand uit die perde se derms te krap. Gedurende hierdie periode het 'n stormwind die tentekamp totaal verwoes en ongeveer 150 perde is deur weerlig doodgeslaan. Op 'n Sondagmôre is al die perde op bevel van hul tuiertoue losgemaak en onder toesig van 'n vyftigtal berede wagte na die rivier geneem om te graas en te rol. Omdat hy wou gaan swem, het een van die wagte sy perd aan 'n boomtak vasgemaak. Die perd het geskrik, losgebreek en 'n stormloop onder die loslopende perde veroorsaak. Tevergeefs het die wagte die perde probeer keer. Ewe tevergeefs was 'n sarsie skote onder die voorlopers. In aller yl is die tentekamp ontruim, voordat dit deur die stormende horde platgevee is. Die stormloop is deur Ladysmith – ongevalle en skade onbekend – en tot drie maande later is perde nog gevind, sommiges selfs in die omgewing van Estcourt.

Die Direkteur, Veeartsenydiens was vanaf 1941 verantwoordelik vir die inspeksie van vleis vir militêre gebruik. Later dieselfde jaar is beheer oor melk in die Unie ook aan die SAVD opgedra. Offisiere is na verskillende sentra in die land uitgeplaas en het waardevolle diens gelewer. Waar burgerlike owerhede en offisier-veeartse nie ooreenstemming kon bereik oor die geskiktheid van voedsel nie, is bepaal dat die mening van die offisier-veearts beslissend moes wees. In Mei 1943 is goedkeuring verleen vir die instelling van 'n Vleis- en Melkinspeksieseksie, bystaande uit 10 offisiere en 10 ander range. Depots is oral in die Unie gestig. Vanaf Januarie 1946 is die beheer oor melk en vleis weer aan burgerlike owerhede oorhandig.

Op 7 Mei 1942 het die Direktorate Veeartsenydiens en Remonte saamgesmelt om die Direktoraat, Veeartseny- en Remontediens te vorm. Kolonel P.J. du Toit is aangestel as Direkteur en luitenant-kolonel C.J. van Heerden as Adjunk-direkteur. Die meganisasie van berede eenhede en die ontbinding van remontedepots by Mooiplaas en Ladysmith het 'n groot aantal personeellede van die SAVD oorbodig gelaat. Daar is egter besluit om hulle op die diensstaat te behou in geval berede eenhede weer opgerig word. Op 20 September 1944 is alle lede van die Remonte- en Veeartsenydiens wat nog onder die K Dienskorps geval het, onder die SAVD verenig. Twee assistent-direkteure is aangestel, naamlik majoor H. Warnock-Fielden vir Remontediens en majoor A.M. Howie vir Veeartsenydiens. Luitenant-kolonel Van Heerden is in 1944 deur majoor J. Zwarenstein as Adjunk-direkteur opgevolg en majoor Warnock-Fielden deur luitenant G. Marriott, wat aangestel is as stafoffisier, SAVD. In dié jaar is die SAVD se organisasie ook opgeknap en uitgebrei en die dierekords op datum gebring.

Weens die toetrede van Japan tot die oorlog en 'n tekort aan rubber- en petroleumprodukte wat ondervind is, moes die gebruik van motorvervoer in die Unie verminder word. Om noodsaaklike militêre dienste te handhaaf, is besluit om van dieretransport gebruik te maak. Op 19 Maart 1942 is die eerste Dieretransport- en Remontedepot by Voortrekkerhoogte geopen. Die depot se naam is in 1943 na no 4 Dieretransport-subdepot verander en onder beheer van no 1 Dieretransportdepot, Premiermyn geplaas.

Die aanvanklike sterkte van die depot was twee blankes en 38 nie-blankes, ses waens, 20 karre en 110 muile. Later is die sterkte uitgebrei na sewe blankes, 126 lede van die *Cape Corps* en 250 perde en muile. Tot September 1943 was die gemiddelde maandelikse vrag wat gekarwei is 3 600 ton en die afstand afgelê 12 000 myl. Die depot is op 31 Oktober 1945 ontbind.

Die Voertuigonderhoudseenheid, SAVD, is op 11 November 1942 by Voortrekkerhoogte onder luitenant Farndell opgerig. Lede van die SAVD, wat ondervinding gehad het van grofsmidwerk, moes sorg vir die instandhouding van trekvoertuie. Die personeel het tot in September 1944 onder KMG geval, toe hulle na die SAVD oorgeplaas is. Die eenheid was verantwoordelik vir die instandhouding van buitebande en trekvoertuie, asook vir die bou van nuwe voertuie op motoronderstelle. Die eenheid is op 31 Oktober 1945 gesluit.

Verdere Dieretransportsubdepots is in 1942 en 1943 gestig, naamlik no 2 Dieretransportsubdepot by Ladysmith, no 3 by Piet Retief, no 5 by Potchefstroom en no 6 by Tempe. No 1 Dieretransportdepot by Premiermyn is op 15 Februarie 1943 gestig en was die hoofdepot. Die werksaamhede het hoofsaaklik uit die vervoer van militêre voorrade en personeel bestaan. Die bevelvoerders was kaptein C.A. Allies en kaptein A.S. Warren. Op 18 Maart 1946 is die eenheid ontbind.

No 1 Veeartsenyhospitaal, Voortrekkerhoogte (V) het op 30 September 1942 tot stand gekom met die ontbinding van Depot Kie. Die hospitaal het as opleidingsentrum gedien vir die veeartsenypersoneel en die versorging van siek diere in die gebied. Kaptein H.H. Curson was in beheer van die opleiding. Die gemiddelde maandelikse personeel sterkte in 1942 was ongeveer 200. In die jaar is 357 perde en muile tot die hospitaal toegelaat. Hiervan is 348 weer ontslaan. In 1943 is Curson deur kaptein B.M. Horwitz, en deur kaptein J. Zwarenstein later dieselfde jaar opgevolg. Drie-honderd gevalle is in 1943 toegelaat, waarvan 265 ontslaan is. Die personeel het ook troeteldiere van die omgewing behandel. Vanaf Januarie 1944 tot Mei 1945 is 661 perde en muile behandel, waarvan 561 ontslaan is. Die eenheid is op 30 April 1946 amptelik ontbind.

No 2 Veeartsenyhospitaal, Premiermyn, is in Februarie 1943 gestig. Tot op 8 Desember is 728 gevalle toegelaat. No 2 Veeartsenyhospitaal, Standerton, is in Desember na no 1 Dieretransportdepot by Premiermyn oorgeplaas. Behoefte aan beter geriewe het ontstaan en die hospitaal is uitgebrei. Die eerste bevelvoerder was kaptein D.E. Osbourn, gevolg deur luitenant J.G. Townsend. Die hospitaal was verantwoordelik vir siek diere in die Premiermyn omgewing en inenting teen perdesiekte en tetanus. Min aansteeklike siektes het hier voorgekom. Vanaf 8 Desember 1944 tot 25 Julie 1945 is 3 999 gevalle behandel. Op 10 November 1945 is die eenheid ontbind.

Bek- en klouseer het in Desember 1944 in Oos-Transvaal uitgebreek. Die beheer en uitwissing van die siekte is aan die SAVD opgedra. 'n Afdeling bestaande uit een offisier en 10 ander range het die taak aangepak, en 'n gebied van ongeveer 300 vk myl behandel. Teen Mei 1945 was die siekte onder beheer en die SAVD is in Junie onttrek.

Diens buite Suid-Afrika

Vroeg in Mei 1942 het die bevelvoerder van Vaalhartz-Remonteweidingsplaas opdrag van die Direkteur, Veeartseny- en Remontediens ontvang om 'n Paktransportkompanie te stig. Twee seksies muile is gevorm, naamlik 'n Dierekarseksie en 'n Pakdierseksie. Beide seksies is by Vaalhartz opgelei. Die bevel om vir aktiewe diens na Madagaskar te vertrek, het gekom voordat die opleiding voltooi was. Op 6 Augustus 1942 het die eenheid by Diego Suarez in Madagaskar aangekom. Die 308 diere is afgelaai en via Antisrane na Sakaramy, waar die 7de SA Brigade gestasioneer was, getrek. Die eenheid is vir diens aan die *Royal Army Service Crops* toegeken. Die Assistent-direkteur van *Supply and Transport, Fortress Command* het dadelik die motortransport met die Dierekarseksie vervang. Subseksies is gestig en na voorposisies gestuur waar verbindingslinies met die Hoofkwartier feitlik nie bestaan het nie. Die Pakdierseksie is vir soortgelyke doeleindes aangewend, maar slegs in gunstige weersomstandighede.

Die werksaamhede van die eenheid is deur 'n personeeltekort bemoeilik. Die subtropiese klimaat van Madagaskar het die diere nie veel aangetas nie. Ook het die swakverteerbare voedsel wat aan die diere weens gebrek aan rantsoene gevoer is, nie skadelike gevolge

gehad nie. Tydens die reënseisoen en siektetyd was die eenheid sonder 'n offisier-veearts. Loslopende perde en muile, asook die wat van die Franse gebuit is, is in 'n remonte-depot georganiseer. Gevangenes van die Franse personeel is opgelei en in transporteenhede georganiseer om die werk van die Paktransportkompanie met hulle vertrek oor te neem.

Die SA Brigade het Madagaskar teen die einde van 1942 verlaat. Die bevelvoerder van die paktransportkompanie is in beheer van dissipline op die eiland geplaas. Die eenheid het verdere opleiding op Madagaskar ondergaan, waarin veral lede van die *Cape Corps* uitgeblink het. In Junie 1943 het die eenheid met die *SS Naringa* na Durban teruggekeer.

Na hulle terugkeer, het hulle maandelank by Kafferskraal gewag om uitgeplaas te word. Op aanbeveling van die Adjunk-direkteur van Veeartseny- en Remontediens, is die eenheid op 1 November 1943 na die ou Remontekamp by Mooiplaas verskuif.

Die Aankopekommissie van die Indiese Leër het van die diere by Mooiplaas gekoop. In Desember 1943 is besluit om Mooiplaas te gebruik as 'n oorlêdepot vir diere bestem vir Indië. Diere wat nie onmiddellik verkoop kon word nie, het in hulle honderde per week aangekom. Twee addisionele kampe, Mooiplaas 69 en Skurweberg, onder beheer van die hoofkamp, is opgerig. Lede van die *Cape Corps* het die twee kampe beheer.

Perdesiekte het vanaf Maart tot Mei 1944 die lewens van 76 perde en muile geëis. Keratitis het ook voorgekom. Van die 448 gevalle wat behandel is, het slegs vyf diere blind geword. Nuwesiekte het voorgekom, maar nie ernstige afmetings aangeneem nie. Die diere is teen luise gedip.

Tydens die eenheid se verblyf op Mooiplaas, is 186 perde, 4 653 muile en 5 490 donkies, bestem vir die Indiese Leër, gehanteer. Verder is 920 trekperde en 47 typerde vir die UVM afgerig. Verkope van perde aan lede van die UVM en die publiek is ook behartig. Die paktransportkompanie is op 7 Julie 1945 ontbind en op 31 Augustus gesluit.

Verskaffing van diere aan Indië en Burma

Op versoek van die Indiese Regering is 'n Indiese Leërremontekommissie in 1942 in die Unie gestig. Luitenant-kolonel R. Matthews van die *Indian Army Remount Department* het in April 1942 in Pretoria aangekom om die eerste 1 000 muile vir die leërs in Indië en Burma aan te koop. Die Direktoraat, Veeartseny- en Remontediens het personeel vir die aankoperade verskaf. Behalwe muile, is donkies, ponies en perde, varke en vee aangekoop en verskeep.

No 1 Weidingsplaas, SAVD, by Vaalhartz, het vanaf 1942 tot 1946 bestaan. Diere bestem vir verskeping na Madagaskar (Paktransportkompanie) en Indië is hier gehou. Ook is voer en groente hier gekweek. Swaar verliese onder die diere is weens perdesiekte gely. In 1942 is 187 perde en muile dood of tot niet gemaak, in 1943 106, in 1944 98 en in 1945 (tot einde Mei) 124. Perde is die swaarste getref. Op 30 November 1945, met die ontbinding van die Indiese Remonte-aankopekommissie, het no 1 Weidingsplaas oorbodig geraak. Die depot is op 28 Februarie 1946 ontbind.

Die UVM het begeleidende geselskappe tussen Durban en Karachi verskaf. Altesaam 58 verskepings diere na Indië is gemaak, waarvan 56 deur die UVM vergesel is*. Die Indiese regering het die begeleidende geselskappe betaal. Die enigste ongevalle wat voorgekom het, was die verlies van die *SS Napura,* wat weens vyandelike aksie op 3 Maart 1943 gesink is. Onder die 90 personeellede wat omgekom het, was majoor A.M. Howie, assistent-direkteur, Veeartsenydiens**.

No 13 Diereverskepingsdepot, SAVD, Durban en Pinetown, is in 1943 vir die verskeping van diere na Indië gestig, om as subdepot van die Hoofremontedepot by Standerton te dien. Die subdepots is in 1946 gesluit.

Die aantal vrektes onder diere vir die Indiese regering (uitgesluit afgekeurde en tot-niet-gemaakte diere) het vanaf Mei 1942 tot 30 Oktober 1945 717 beloop. Perdesiekte het die grootste tol geëis, nl. 148 gevalle. In totaal is 38 151 diere na Indië verskeep. Hiervan was 22 016 muile, 10 022 donkies, 3 527 perde, 323 beeste, 2 259 varke, 3 angorabokke en 1 zebra.

Op 14 Februarie 1946 het veldmarkskalk sir Claude Auchinleck veldmarskalk Smuts per brief bedank vir die diens wat KMG onder generaal Mitchell-Baker in verband met versending van diere na Indië gelewer het.

In totaal is 2 327 muile en 6 486 perde tydens die duur van die oorlog aangekoop. Hiervan is 300 muile en 3 895 perde in Suid-Afrika verkoop en 1 527 muile en 851 perde aan ander regerings verkoop en verskeep. Van die muile is 435 in Suid-Afrika dood of vernietig en drie tydens aktiewe diens. In Suid-Afrika is 1 599 perde dood en een op aktiewe diens. Een muil en elf perde is verloor of afgeskryf. Aan die einde van die oorlog het 61 muile en 129 perde oorgebly.

Die Suid-Afrikaanse Veeartsenydiens is op 1 November 1946 ontbind.

Gedurende die tydperk September 1939 tot Mei 1946 is die volgende dekorasies en eervolle vermeldings deur lede van die SAVD verwerf:

Kaptein J.W.A. Brookes, MBE
Kaptein L.W. Rossiter, MBE
Luitenant J.P. Halberstadt, MBE
AO2 E.W.J. Hudson, BEM
Staf-sersant J. Hurst, BEM
Hoefsmid-sersant F.J. Bestbier, BEM
Sersant T.R.C. Worthington-Cooper, BEM
Hoefsmid-korporaal J.P. Meyer, BEM
Kaptein S.W. Findley, Eervolle vermelding
Korporaal G.E.C. Hare, Eervolle vermelding.

Kolonel R. Matthews van die Indiese Remonte-aankopekommissie het die OBE vir sy diens in Suid-Afrika verwerf.

*Drie skepe is hiervoor gebruik: die SS Napura, SS Naringa en die SS Gazala. Elke skip kon 700 tot 1 000 diere neem, met 'n veeartsoffisier, 25 onderoffisiere van die SAVD en 150 kleurlingtroepe. Die reis van Durban na Bombaai of Karachi en terug het bykans drie maande geneem. Die inskepingsdepot was langs Greenwoodpark, agter die Lion-vuurhoutjiefabriek te Durban, geleë.

**'n Paar dae voor hy moes inskeep is AO Paulsen deur 'n muil aan die vinger gebyt en ernstig getroumatiseer. Dit het septies geword en sou geamputeer moes word. Hiervan wou sy bevelvoerder, maj. Howie, niks weet nie. Lsg. het die vinger met seewater e.a. middels behandel en die infeksie binne drie dae onder beheer gebring. Die beseerde se plek aan boord is deur 'n sersant van die remonteeskadron geneem; so is waarskynlik sy lewe gered. Hy het vir oulaas maj. Howie aan boord gaan bedank en gaan groet. Slegs twee onderoffisiere en 'n paar kleurlingtroepe het die torpedering oorlewe. Onder die oorledenes was AO J.W. Killeen, die mees senior hoefsmid en veterinêre onderoffisier in die Weermag. Persoonlike mededeling: AO Paulsen.

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REVIEW OORSIG

FACTORS AFFECTING PROLAPSE OF THE PREPUCE IN BULLS

H.A.W. VENTER and C. MAREE

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The present state of our knowledge on the symptoms, pathogenesis and breed susceptibility of preputial prolapse in bulls is reviewed together with the anatomical and physiological relationships that operate in the development of a prolapse of the inner layer of the sheath. Suggestions for the elimination of the condition through selection are made.

INTRODUCTION

Prolapse of the prepuce occurs in a number of cattle breeds but its far-reaching detrimental consequences occur with greater frequency in certain breeds[4 9 10 16]. For example, up to 30% of four year old Santa Gertrudis bulls had to be eliminated because of prolapse of the sheath and subsequent phimosis and paraphimosis[20], as against relatively few cases in the Afrikaner breed[9].

The present state of our knowledge is summarized and set out in the Table.

Table: FACTORS AFFECTING PREPUTIAL PROLAPSE IN BULLS

Injury and Infection	Trauma Tick bites Poor stable hygiene IPV
Functional and anatomical derangements	Enlarged preputial orifice Long *lamina interna* of the prepuce Lack of tonus in the retractor penis muscles
Inefficient sphincteric action	Tone of the protractor and possibly retractor muscles of prepuce Size of these muscles Inefficient action of these muscles
Breeds	
1 Increased susceptibility	*Bos indicus* breeds in general (except Afrikaner) Brahman Santa Gertrudis Polled Breeds
2 Decreased susceptibility	*Bos taurus* breeds in general (except polled breeds and Hereford) Shorthorn Jersey Friesland Afrikaner Horned Breeds

SYMPTOMS AND PATHOGENESIS

In bulls suffering from prolapse of the sheath, the *lamina interna* (mucous membrane) everts to varying extent through the preputial orifice. In the early stages it frequently appears spontaneously even in bulls that are undisturbed at grazing. The mucous membrane initially may appear normal but oedema and inflammation readily supervene.

Chronic prolapse is associated with primary or secondary injury to the sheath[6 9 16 17]. Tick bites, particularly by types with potent toxins, grass awns, thorny shrubs and the like bring about an increased incidence of injury in bulls with pendulous sheaths. Oedema and fibrous changes develop and are frequently progressive. The penis, at service, protrudes with difficulty and this aggravates the condition through further injury. Ulceration of the internal lamina follows[9 16 17 29]. Affected bulls are reluctant to serve owing to pain associated with erection[22].

Penetration of infective organisms into the *lamina interna* of the sheath can be a primary cause of prolapse[7]. Bulls with non-pendulous sheaths are thus not necessarily immune to the condition and proper stable hygiene plays a definite role in the aetiology. Similarly a neglected Infectious Pustular Vulvovaginitis (IPV) infection may render a bull susceptible.

BREED DIFFERENCES

Prolapse of the prepuce is more frequent in some breeds than in others[4 9 12]. Out of 244 bulls from 13 different breeds prolapse of the prepuce was recorded in 85% of polled breeds and only in 1,4% of horned breeds[12]. In another study again, only 4 cases of prolapse were reported in polled bulls out of a total of 13 that were presented for surgery (8 Hereford, 2 Angus, 2 Friesland and 1 Jersey). According to the Table, prolapse might be the result of a variety of factors and its over-all incidence should not be regarded as an indication of breed susceptibility.

Hofmeyr[9] reported surgical intervention for the treatment of preputial prolapse in 5 Hereford bulls out of a total of 27 cases, but he does not report on the number of polled bulls treated. A higher incidence of pathological prolapse has to be accepted in the case of the Hereford and particularly in polled Herefords[17]. After an extensive study of the literature on preputial prolapse in bulls[10] no cases were found in the Shorthorn breed or its crosses. A significantly reduced incidence of prolapse in cross-bred Santa Gertrudis bulls was recorded, however, where the maternal grandmothers were Shorthorns.

A high incidence of prolapse of the prepuce is reported in *Bos indicus* bulls like the Brahman[9 11] and Santa Gertrudis[11]. Out of 20 cases of pathological prolapse of the prepuce, 19 were of the Santa Gertrudis breed[6].

A relatively low incidence of prolapse of the prepuce is reported in certain dairy breeds, particularly in Jersey and Friesland cattle[9 12]. This is all the more remarkable seeing that dairy breeds are subjected more frequently to intensification and unhygienic stabling than beef breeds, conditions which feature in the aetiology of preputial prolapse.

The Afrikaner breed, a *Bos indicus* type which predominates in South Africa, appears to be relatively refractory to preputial prolapse. Hofmeyr[9] reported on 27 bulls presented for surgery on the penis or prepuce. Only three of these were Afrikaner bulls, two with primary trauma and the third one with an abnormally large preputial opening.

Breed differences in the incidence of prolapse of the prepuce indicate that heritability plays a role in the aetiology of this condition or is associated with the predisposing mechanisms involved. The additive genetic influence in a population of Santa Gertrudis cross-bred bulls was indicated[10], in which a heritability estimate of $0,35 \pm 0,3$ was reported. Although the standard error was relatively high, it was concluded that culling of bulls with prolapse of the prepuce could reduce the incidence of the condition. Accordingly, significant ($P < 0,05$) differences in the incidence of prolapse in the progeny of different sires were reported[10].

ANATOMICAL ASPECTS

It is appropriate to consider the anatomical features that might predispose to prolapse of the prepuce in bulls.

Four facets are basically involved, namely pendulousness of the sheath, its length, the extent of the *lamina interna* and the size of the sheath opening. These features, probably constitute the most important differences between *Bos indicus* and *Bos taurus*.

A large preputial orifice is generally accepted as a predisposing factor in pathological prolapse of the sheath[4 5 9 10 11]. Variation in length of sheath in a group of Santa Gertrudis cross-bred bulls accounted for only 11% of the variation in the severity of prolapse recorded[10]. Likewise, no relationship between length of the sheath and the incidence of preputial prolapse could be established[13]. An incidence of 29% of sheaths classified as short, 64% of medium length and 7% long in 429 German Holstein bulls was recorded[1]. Although the influence of body mass was not eliminated[4], it was found that the penis and sheath of *Bos indicus* was 550 mm longer than in *Bos taurus* bulls. These findings indicate additional predisposing factors in preputial prolapse in *Bos indicus* type bulls. Increased extent of the *lamina interna* of the prepuce in breeds with pendulous sheaths[4 9] is considered to predispose to prolapse. In addition, the slanting position of the penis in the sheath as well as the tonus of the *M. retractor penis* might play a role in the predisposition to prolapse of the prepuce[9].

Breeds of cattle[4] and individuals within breeds[1 10] differ significantly in relation to the size of the preputial orifice and preputial prolapse associated with it. The importance of the size of the sheath opening and the activity of the muscles involved in its control has been discussed[2]. Heritable factors regulate the size of the preputial orifice and the activity of the muscles involved in its control. Congenital stenosis of the orifice[18] and stenosis of the *lamina interna* at the orifice[9] were reported. From the work of Hofmeyr[9] a low incidence of preputial prolapse in the Afrikaner is obvious. The small size of the preputial orifice and increased efficiency of neuromuscular control over the sheath may account for this. A small preputial opening directed cranioventrally largely prevents prolapse of the *lamina interna*. In the studies[8 10] where no relationship between circumference and diameter respectively of the preputial orifice and the incidence of preputial prolapse could be established, the lack of any relationship could be attributed to differences among bulls in the efficiency of mechanisms that control the sheath opening, which it was not possible to measure.

FUNCTIONAL EFFICIENCY OF THE MUSCULATURE, NERVOUS SUPPLY AND NEURO-ENDROCRINOLOGICAL BEHAVIOUR

According to various reports there are differences in the incidence of functional derangements of the musculature involved, in their nervous control and in neuro-endocrinological behaviour between bulls. The musculature and nervous control of the penis and sheath was reported on[4] and studied in depth by Ashdown & Pearson[2]. They reported that the cranial muscles of the prepuce (protractors) raise, protract, and constrict the orifice of the sheath. They are innervated by the lateral thoracic nerve, neurectomy of which paralysed the muscles of the sheath and resulted in eversion of the *lamina interna* in three out of seven bulls.

The effectiveness of the cranial muscle of the sheath in closing the orifice varies considerably in different bulls[2]. Friesian and Jersey bulls have powerful sphincteric action. This mechanism is less effective in Hereford and Angus bulls. Bilateral neurectomy of the lateral thoracic nerve resulted in the relaxation of the sheath opening, resembling that commonly seen in Hereford bulls. Eversion of the sheath followed on neurectomy even in bulls of the Jersey and Friesian breeds which are rarely known to suffer from eversion of the *lamina interna*. The caudal muscles of the prepuce (retractors) could not be shown to exert any marked action on the penis or sheath during the non-erectile state. It was suggested that these muscles possibly contribute to the stabilization of the preputial mucous membrane, although myotomy of these muscles failed to produce eversion of the *lamina interna* in any of four bulls[2]. The size of the caudal preputial muscles may vary from 300 mm long, 50 mm wide with a thickness of 20 to 30 mm in some bulls to fine rudiments in others, while in bulls of the polled Devon, polled Hereford and Angus breeds, these muscles were confirmed to be completely absent[2]. This is of special interest in terms of the incidence of preputial prolapse reported in polled breeds[4 9 12], despite the negative results produced by myotomy.

Myotomy of the retractor muscles of the penis failed to produce prolapse of the *lamina interna*[2]. Immobility of the penis at rest resulted and the tip of the penis lay close to or even out of the orifice of the sheath, followed by delay in replacement of the penis after service. It was concluded from radiological studies that eversion of the *lamina interna* might further be linked to movement of the penis not associated with full erection and in which the tone of the retractor muscles of the penis might be of importance[14].

Sexual behaviour and secondary male characteristics

as well as the influence of high temperature have not been investigated in relation to preputial prolapse.

ELIMINATION OF PREPUTIAL PROLAPSE

Although surgical intervention affords relief of prolapse of the prepuce[9], it is obvious that this problem can be eliminated only through selection.

It has now been shown conclusively that the size and pendulousness of the sheath, which was selected for in the hope of increasing heat tolerance, play no role in adaptibility in cattle[15 19]. Separation of bulls predisposed to prolapse of the *lamina interna* should be attempted with the aid of Table 1. This involves the introduction of new genes into certain breeds because of lack of variation. Elimination of this problem without sacrifice of the desirable qualities of any breed concerned is, however, possible[9]. This is also proved in the case of the Brazilian Nellore where excessive size of the sheath and prolapse of the *lamina interna* have been largely eliminated without any loss of performance in the breed. Variation in sphincterlike muscle activity has been determined[2]. Rigorous selection for this trait should be practised.

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SWIMMING – A METHOD TO STUDY THE PHYSIOLOGIC RESPONSE OF THE HORSE TO EXERCISE

T.K. NICHOLL, G.F. FREGIN and N.H. GERBER

ABSTRACT: Nicholl T.K.; Fregin G.F.; Gerber N.H. **Swimming – a method to study the physiologic response of the horse to exercise.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 313–315 (En). Univ. Pennsylvania, School of Vet. Med., C. Mahlon Kline Orthopedic and Rehabilitation Center, New Bolton Center, Kennett Square, Pa. 19348 U.S.A.

The literature on exercise physiology in the horse with special reference to swimming is briefly reviewed. The use of a pool for swimming horses is described and a technique discussed for the collection of haematologic and haemodynamic data using this form of exercise.

INTRODUCTION

The increase in acceptance of swimming as an adjunct to, or substitute for, conventional methods of training horses and the use of the pool in rehabilitation of racehorses following injury has promoted questions concerning the basic physiological response to this form of exercise. Veterinary surgeons may wish to recommend that horses be swum, but no information is available to indicate its advisability or efficacy. A previous study on swimming performed by Asheim, Knudsen *et al*[5] indicated that, on the basis of heart rates and blood lactate levels work in the pool was strenuous but submaximal in nature. The value of this form of training, he concluded, was in preventing further trauma by concussion while continuing to exercise. Recent work by Murikami, Imahara *et al*[23] involved physiological measurements taken before and after swimming, but no measurements were taken during the exercise period. Further study, therefore, seems necessary if the value of swimming is to be investigated fully and the physiological responses to this form of exercise elucidated.

MATERIALS AND METHODS

Ten research horses of varying breed, age, mass and sex were available for study. The horses were in good bodily condition and free from detectable signs of heart and lung disease. Subcutaneous relocations of the carotid arteries had been performed previously to facilitate arterial blood sampling.

The indoor swimming pool was adjacent to the barn and had a preparation area in which the entry/exit ramp to the pool was located. The pool was 5,5 m in diameter with a 0,6 m overhang. It was 3,7 m deep, held 127 000 ℓ and had a skimmer pump and overflow system. A heater maintained the water at a temperature of 29 to 31°C. The ramp area had a non-slip mat and a swing gate at its entry point to prevent horses from turning away from the pool as they entered (Fig.).

To accustom the horses to swimming, they were exercised at the same time every morning, two h after feeding. Horses were led down the ramp and by means of two head ropes attached to the halter were directed either clockwise or anticlockwise around the pool. Once in the pool, the lifting gate at the circumference could be closed. The gate was lifted when the horse commenced its last circuit of the pool and after the handler on the inside rope had crossed the gate. The horse could then be led from the pool when he next reached the ramp.

It was possible to obtain physiological measurements from the horse while swimming. Arterial and venous catheters were introduced percutaneously and sutured to the skin by tape tags. The electrocardiogram was monitored by direct wire connections. A tail rope used in addition to the head ropes resisted the forward force of the swimming horse. The horse thus swam in place and was accessible for haematologic and haemodynamic measurements. When all data had been collected, the catheters were temporaily disconnected, the tail rope restraint released and the horse swam from the pool. Measurements were then repeated at the top of the ramp area for up to one h after swimming.

DISCUSSION

Swimming appears to have been little studied as an exercise medium[5 14 15 23], despite the fact that many horses are being conditioned using swimming either exclusively or as part of their training regime. It was felt, therefore, that an investigation into the use of the pool was warranted. Environmental conditions could be closely controlled and blood samples, with heart and respiration rates, blood pressure and cardiac output readily obtained at any time during the exercise period.

There were practical difficulties associated with the use of the pool for exercise. The main disadvantages were related to the management of the horses in such a manner as to avoid injury to the horse and handler. The most difficult period was the first few days of swimming. The initial reluctance to enter the ramp area to the pool could be met by using the swing gate at the top of the ramp to push the horse from behind. Once in the water, it was unusual for a horse to offer great resistance and with a little encouragement it was easy to lead him into the pool. Horses swam initially by providing most of their propulsion with the forelegs. Unless the handlers on the head rope maintained a forward motion, the rear quarters could sink, making it possible for the horse to flip over backwards. The ensuing panic, should this occur, was stressful for handlers and horse, predisposing both to the possibility of serious injury, as well as a thorough drenching. It was also important for the person on the inside head rope to keep the horse away from the edge of the pool and to avoid any sudden or excessive pulls which might unbalance the horse.

In order to accustom the horse to swimming it was led in and out of the pool for one circuit without closing the gate. This procedure was repeated three to four times daily for the first few days. Swimming time was gradually increased from one to ten min depending on the condition of the horse. Once the horse had gained confidence in the water, the handlers on the headropes assumed a position at approximately ninety degrees to the horse's head.

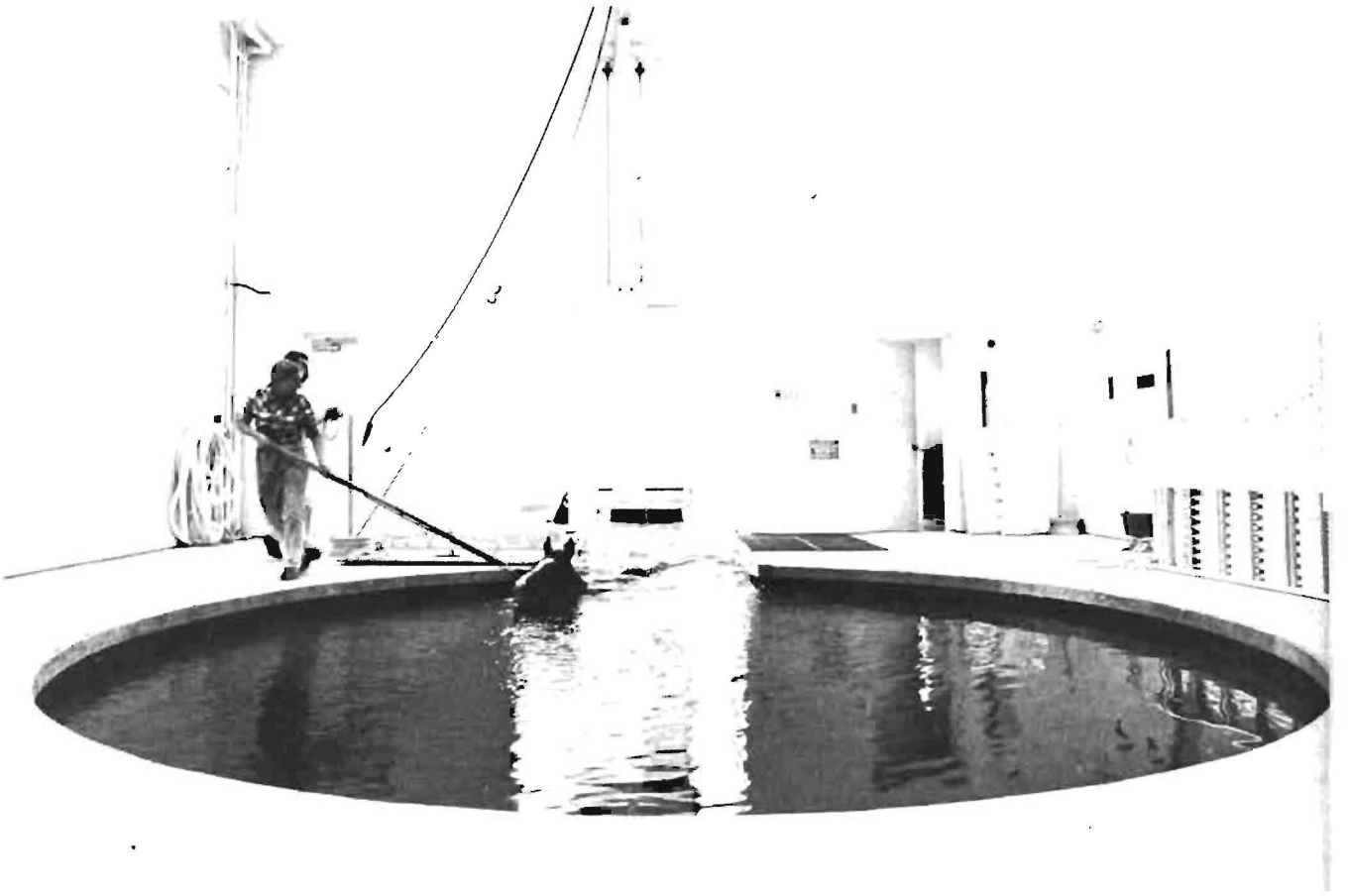

Fig. Horse swimming into pool from entrance ramp. Pole and rope attached to halter (Cavesson) is used to guide horse around pool. Gate may be closed after horse has entered pool.

Horses that could swim comfortably for 5 min were tied by their tails and swum in place in order to collect experimental data. Using this procedure, we encountered a serious problem when horses stopped swimming. This had not been seen during the free swim. The result was a loss of lateral stability, with the horse floating on its side. Attempts to encourage swimming frequently met with failure until the horse began swimming again of its own volition. This was often followed by a violent thrashing as the horse attempted to recover upright position. In all cases it was best to remove the horse from the pool as soon as it had begun to swim. Regular daily swimming gradually improved even the most reluctant of equine aquanauts. Many performed calmly and consistently enough to enable the handlers to substitute a pole and cavesson for the two head ropes and halter (Fig.). It was found inadvisable, however, to use this method unless the horse was a proven performer, since the choice during any emergency was either abandoning head control or joining him for a swim.

It was normal for the horse to adopt a modified breathing pattern in the pool. This was a maximum short inspiration followed by a slow expiration against a closed glottis and then a forced end-expiratory effort. Since most of the horse was immersed save the upper part of the face and nares, this method of breathing enabled the airway to be closed for a maximum period of time during the respiratory cycle. This was frequently associated with a raised upper lip and flattening of the alar folds.

The average respiratory rate during swimming of 24 breaths/min increased to 45 after exit from the pool. Bleeding from the external nares was occasionally noted but could usually be avoided by gradually increasing the level of work in the pool.

Horses were scraped to remove excess water and then returned immediately to their stall. No untoward problems such as "tying up", colic or repiratory infections were encountered.

Development of standardized exercise tests are essential for the study and comparison of responses to exercise in any species. Performance tests with data collected before[4 25 26] and following maximum efforts[5 11 18 27 30] have been difficult to interpret because of the numerous variables that can not be controlled. Submaximal forms of exercise using the longe line[9 16] or under tack, be it ridden[1 2 3 5 6 8 9 16 26 27] or in harness[5 12 13 17 20 21 22], can be subjected to greater control as regards time and distance, although workloads will vary from test to test.

Another fundamental problem is the difficulty of obtaining physiologic and haematologic data during exercise. This must be considered essential, as the precipitous fall in heart rate during the first minute after exercise reflects equally rapid changes in other parameters. In this respect, the use of the treadmill has facilitated the taking of blood samples and other measurements during exercise as well as allowing the experimentor greater control over workload and environmental conditions. In our hands, tethered swimming in place against a calibrated strain gauge allows similar estima-

tions of workload when used in conjunction with simultaneous haematologic and haemodynamic measurements.

CONCLUSIONS

Our experience to date suggests that it is possible to use the pool as an exercise medium for horses. Furthermore, it seems possible to develop a standardized exercise test using the pool to obtain cardiovascular, haematologic and respiratory measurements during and after the work period. It is hoped that future investigations will produce results allowing a more accurate determination of the causes of poor performance and help elucidate how best to use the pool for training purposes.

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CUBE COLIC

D.H.G. IRWIN and DENISE W. HOWELL

ABSTRACT: Irwin D.H.G.; Howell, Denise W. **Cubic colic.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 317–319 (En) Practitioners, P.O. Box 4107, Alrode, 1451, Transvaal, Republic of South Africa.

"Cube colic" is described and vain attempts to cause the problem on an experimental basis are recorded. It is concluded that not all horses are susceptible to cube colic and if colic occurs in horses being fed on cubes, it is not necessarily due to feeding of cubes. Nomenclature of bowel disorders is considered.

INTRODUCTION

A few years ago we diagnosed about 25 cases of acute and subacute "cube colic" over a period of 6 months. These cases gave rise to discussions with a manufacturer of horse cubes and in due course experiments were conducted to try to reproduce the disease.

DESCRIPTION OF CUBE COLIC

It is common for horsemen and veterinary surgeons to designate as "cube colic" certain conditions of abdominal discomfort in horses which are fed upon cubes. It would be better if the term were restricted to those cases of indigestion which result from overeating or maldigestion of cubes and to exclude those cases in which the primary cause of the discomfort arises outside the gut lumen, e.g. interference with blood and nerve supply to any part of the gastrointestinal tract.

As in any abdominal discomfort, "cube colic" may give rise to a wide range of signs and be of a broad spectrum of seriousness. Three types of "cube colic" can be recognised:

1. acute gastric overload;
2. subacute gastric overload and enteritis with flatulence;
3. low grade chronic intestinal catarrh.

All three types are associated with acidosis.

Types 1 and 2 both yield characteristic lactic acid odour through the stomach tube, and are differentiated from one another by the volume of air or fluid which can be introduced into the stomach before extreme discomfort or regurgitation occurs. In Type 1 as little as 250 mℓ fluid administered into the stomach tube causes severe discomfort, or the fluid may not run into the stomach at all; there is simply no room and no further expansion is possible.

Type 1 is the most difficult to treat and a fatal outcome is to be feared. This form is closely similar to overeating by horses on grain, with the added complication that most cubes have a higher protein rating than grains. The problem is that the vast bulk of ingesta can no longer be moved by the gastric musculature and only a small surface area of the mass can be affected by any medicaments introduced into the stomach by mouth or by tube. The animal suffers great pain and very rapidly presents signs of shock and toxaemia: a thin rapid pulse, injected mucosae, cold sweating, extreme anxiety and a progressive haemoconcentration. Ingesta may be expelled through the nose. Sometimes 1 to 10 ℓ of gastric content can be removed through the stomach tube but in most cases attempts at gastric lavage, even under general anaesthesia with an endotracheal tube in place, are not of material value. During one lengthy surgical intervention, when this procedure was attempted, much stomach content was removed: at *post-mortem* examination, however, it was obvious that only a very small proportion had been removed. The rate of emptying of the stomach via the pylorus is so slow that the fermenting mass in the stomach releases more toxic products of maldigestion than can be counteracted by medication. One's only treatment can be to keep the patient free of pain until a miracle occurs or death gives merciful release.

Type 2 is easier to treat and the prognosis is fair to good. Flatulence is the greatest danger and in extreme cases should be relieved by paracentesis. In these cases the stomach content may be sufficiently fluid to allow escape of ingesta through the stomach tube, and as much as 15 ℓ has been released by this means. A small surgical abdominal incision over the point of the greatest distention and pucture of the bowel by trochar, followed by purse string suture and routine closure, has yielded satisfactory to good results. If bowel sounds are good and passage of anal flatus occurs, one delays paracentesis in the hope of avoiding it. Analgesics, demulcents, antacids, surface tension reducers and lubricants by tube are indicated. Bicarbonate of soda which neutralises an acid bowel content with the liberation of CO_2 is capable of causing death by asphyxiation within 20 min. Magnesium hydroxide, as milk of magnesia, or as a suspension of magnesium oxide (which we have recently adopted) is to be preferred; it produces water and not gas upon neutralising acids.

Type 3 occurs in most horses in hard work, where the ratio of cubes to roughage exceeds 70:30. This state is recognised by droppings of varying degrees of softness and unpleasant odour. These droppings made into a slurry with deionised water show a pH of approximately 6,3. The lower the pH the more advisable it is either to reduce the proportion of cubes and increase that of the bulk feed or to use alkalising electrolytes for the maintenance of the body's cations and the horse's performance.

EXPERIMENTAL WORK HORSES, MANAGEMENT AND TESTS

The following 5 horses were use in the first experiment:

Horse	Sex	Age (a)	Breed	Initial Body Mass (kg)	Colour
1 Vulcan	g	6	Thorough-bred	493	Bay
2 Fred-rika	mare	4	Thorough-bred	500	Ch
3 Gold	g	14	X-Breed	492	Ch

4 Rustina	mare	5	X-Breed	500	Ch
5 Magenta	mare	4	X-Breed	550	Gr

Horse 2 suffered a fatal accident whilst at grass between the experiments and only the remaining four participated in Experiment 2.

All horses were kept in adjacent spelling paddocks 7,5 m x 2,9 m made up of posts and rails. Roofing 2,45 m above the ground covered 3,9 m of one end of each paddock. Water was freely available. The cubes fed were "Gold Cup", a commercially available cube. The hay was a good quality teff or eragrostis. Feed was weighed out on a spring balance but wastage was not determined. Body mass of horses was determined about once a week on a Berkel scale.

All horses had been immunised against horse sickness. They were dewormed before starting the experiment and whenever egg counts showed presence of worms. Teeth of all horses had been dressed before the experiment started. The horses were kept free from ticks but stable and house flies produced mild discomfort. Rectal temperatures were taken daily between 0700 h and 0730 h. Feet were dressed every second d and trimmed every 14 to 21 d as necessary.

PHYSICAL EXERCISE

Experiment 1

Each horse was lunged for 20 min on 6 d of the week: sometimes horses were lame or foot sore and were walked 1 h instead.

Experiment 2

The horses were made to swim, starting off with 40 m/d and ending with 360 m/d; only Horse 5 could not do the full work but reached her maximum at 200 m daily.

FEEDING

Experiment 1

All horses received 12 kg/d of feed (± 2,4% of body mass) divided into equal feeds, one at 0730 h and the other at 1700 h. From Day 1 to Day 19 each horse received 1,5 kg cubes and 4,5 kg hay twice daily. On Day 20 and every third day thereafter the mass of cubes at each meal was increased by 0,25 kg and the mass of hay was reduced by 0,25 kg, so that by Day 54 each horse received 6 kg of cubes twice daily and no hay.

Hay was withheld for a further four d and feeding of cubes increased to 6,5 kg twice daily for two d.

Experiment 2

Horses in Experiment 2 were fed hay only for a varying period on their return from grass. Horses 1 and 3 were fed on hay only for 11 d. On Day 12 both were given an unlimited amount of cubes and all hay was removed. On the sixth day on cubes, Horse 1 was again given hay. During this cube feeding period, only Horse 1 presented soft droppings. They were exercised in the swimming pool and as they did more work their feed was increased until they were consuming ± 7,5 kg/d. Horse 1 was then deprived of concentrate feed and roughage for 24 h and the exercise was maintained. Cubes were then fed *ad libitum*. Horse 2 was deprived of all feed for 48 h and was kept doing his swimming work.

Horses 4 and 5 were fed on hay only for 19 d, then starved for 72 h, and then they were fed on cubes *ad libitum* but no hay. These cubes were taken from a bag over which about 10 ℓ of water had been poured 10 d previously.

LABORATORY TESTS

The pH of droppings from each horse was determined 5 d/week on a Knik digital pH meter after mixing fresh droppings (under 1 h from being passed) into a slurry with deionised water at the rate of 1 g faeces: 5 mℓ deionised water. Blood was collected about every 7 d by means of commercially available evacuated EDTA tubes and into plain tubes with no anticoagulant*.

Red and white blood cell counts were done on a Coulter counter model D_2. Haematocrits were determined in Wintrobe tubes swung at 7 500 r/min for 60 min. Haemoglobin was determined on a Leitz photrometer model M. Serum sodium and potassium levels were determined on an Eel flame photometer. Chloride and bicarbonate determinations were done by titration.

RESULTS

Experiment 1

At no stage did any of the five horses manifest abdominal discomfort. From the time 10 kg cubes and 2 kg hay was fed, the faeces lost their pelleted form and became increasingly soft whilst progressing further to a ration of cubes only. When hay again formed 30% or more of the diet, the droppings firmed to normal. The pH of droppings showed a tendency to fall as the proportion of cubes increased. All other parameters which were followed failed to give any clear correlation to the percentage composition of the diet.

Experiment 2

Again the horses failed to show any sign of abdominal discomfort. During periods of starvation 2 horses started biting posts of their spelling paddocks.

DISCUSSION

Experiment 1

The results of this experiment were most surprising in that one would ordinarily have expected at least one of the horses to suffer from abdominal pain if not spectacular illness relating to the digestive tract. The looseness of the droppings discussed in the results of the initial experiment could be accounted for by the lack of bulk feed and the small size of the particles comprising the cubes. The smaller the particulate matter, the quicker is its passage through the gastrointestinal tract.

There are two possible explanations of the failure to produce cube colic:

Firstly, it is possible that the low level of physical stress protected the animals to some extent because the opposite holds true for the genesis of digestive problems, viz., horses placed under heavy work conditions are more prone to digestive upsets. It is possible that the horses were not eating sufficient mass of cubes to develop an upset in the digestive system. If the horses had been worked harder, they may have eaten a greater mass, or may have eaten it more greedily and thereby be more prone to gastrointestinal disorder.

Secondly, possibly the fairly gradual increase of cubes from 3 to 6 kg allowed each horse to adapt its digestive physiology (to acquire a well-adapted series of digestive enzymes?). It is also assumed that the gross mismanagement attempts to produce colic were thwarted by the same process of physiological adaptation (adapted enzyme systems). Acting on this assumption, it was decided to put the horses to grass with no cubes or other supplementary feed for 155 d of the summer, so that all processes of adaptation (induced enzyme systems) for the digestion of cubes could revert to base line.

Experiment 2

This remarkable failure to produce digestive upset is truly noteworthy. The question arises as to why these horses resisted deliberate attempts to cause colic. A number of previously held ideas about aetiology of colic in general and "cube colic" in particular must be re-assessed. In any event one can at least be on one's guard to avoid making a diagnosis of "cube colic" without fairly substantial evidence. Perhaps some other worker would care to repeat these experiments or design others, using young Thoroughbreds in hard training.

Since the conclusion of the work discussed above, we were called to a stable which had experienced "an outbreak of cube colic", although there were no horses ill at the moment. On arrival, enquiry revealed that the stable in question kept 30 riding horses. Over the past year 11 horses had showed abdominal pain and one horse had died: no autopsy had been conducted. Droppings from two of the 30 horses were examined for worm eggs, one revealed 50 eggs/g and the other 350. Most horses were fed 1 kg of cubes morning and evening with added bran; no horse had had over 2,4 kg cubes per day. Hay was available at all times. The horses spent several h/d in paddocks where hay was fed off the ground. The one paddock was sandy. The teeth of three horses were examined: all needed dental care. It was suggested that this stable did not have "cube colic" problems but that regular deworming, provision of hay racks or nets to avoid ingestion of sand, and dental care would be likely to improve matters.

In another stable, feeding of cubes seemed to be causing loss of condition and listlessness. Investigation revealed that the water buckets contained putrid water.

It is concluded that one should exercise some discretion before making a diagnosis of "cube colic" or "cube listlessness".

"COLIC" AND "INDIGESTION"

It is our opinion and recommendation that the term "colic" should be reserved to designate gastrointestinal tract disorders which arise outside the lumen of the bowel. This would include interference with the blood and nerve supply arising from aneurisms and thrombotic emboli; strangulated hernias through the diaphragm, inguinal canal, epiploic foramen, or mesentery; and strangulation by pedunculated lipomas. In these cases peristaltic arrest develops and is responsible for the clinically recognisable entity of a "silent abdomen". Those gut disturbances arising from overeating on grains and cubes or fresh wheaten straw, etc., and other maldigestion or indigestion syndromes should be referred to as "indigestion".

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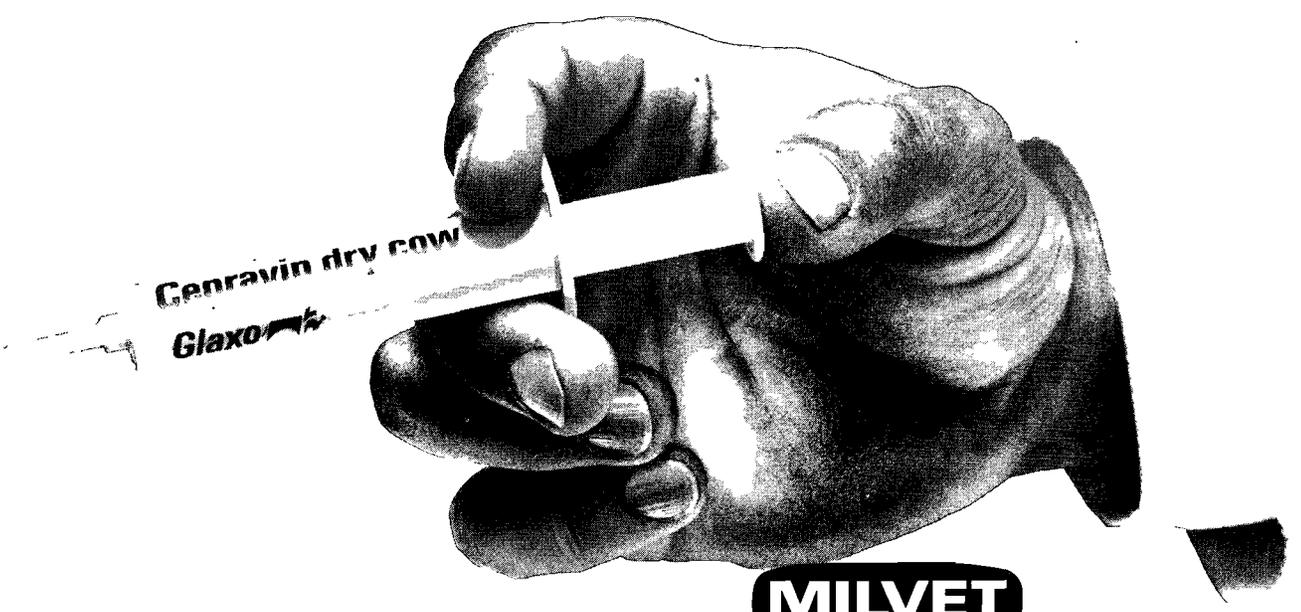

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FATAL OVINE NEPHROSIS CAUSED BY *ANAGALLIS ARVENSIS L.*

D. J. SCHNEIDER

ABSTRACT: Schneider D. J. **Fatal ovine nephrosis caused by** *Anagallis arvensis* L. *Journal of the South African Veterinary Association.* (1978) **49** No. 4 321–324 (En) Regional Veterinary Laboratory, P. Bag X5020, 7600 Stellenbosch, Rep. of South Africa.

Cases of acute mortality in sheep, characterised by severe nephrosis and resultant uraemia, were investigated on two farms 150 km apart in the Winter Rainfall area of the Republic of South Africa.

This condition was experimentally reproduced by dosing sheep with *Anagallis arvensis* L plants. The most conspicious lesion was a coagulative necrosis with intratubular haemorrhage in the renal cortex. The history, clinical signs and the pathology, and experimental reproduction of the disease are described.

INTRODUCTION

During January 1977 an outbreak of a disease in South African Mutton Merino sheep characterised by acute deaths was investigated on a farm in the Tulbagh area. In all the animals autopsied a similar marked nephrosis was present, confirmed by microscopic examination. While investigating the possible cause of these deaths, another outbreak in Merino sheep with identical *post-mortem* and histopathological changes occurred on a farm about 150 km away in the Caledon district.

On both these properties the sheep had been grazing for 17 d on cultivated lands which had been lying fallow for a few months. Both had mountain stream water available and as a result of extraordinarily good summer rains (Table 3) were covered with a large variety of grass, shrubs and weeds. Circumstantial evidence suggested that death had resulted from plant poisoning. About 30 species of plants which had been eaten, were collected and identified at the State Herbarium, Stellenbosch. All the available literature concerning the possible toxicity of the plants was consulted and eventually, by elimination, a short list of five possible toxic species was made and dosing trials in sheep were done on each.

No adverse effects occurred when four of the plants were administered to sheep. The fifth, *Anagallis arvensis* L. however, caused symptoms and pathology indistinguishable from the field cases. As this is the first report of death in sheep from this plant, clinical symptoms and pathology from both experimental and field cases and the description of the plant itself will be given in detail.

EXPERIMENTAL PROCEDURE

The five suspected plants were chopped fine and dosed or fed to the sheep in the following way:

Plants administered without adverse effects

1. *Cucumis myriocarpus* – Naud. amend. Schweick: One sheep received 15 g/kg body mass per day for 4 d[5].
2. *Amaranthus thunbergii* – Moqi: One sheep was dosed with 20 g/kg per day for 30 d[1 4].
3. *Polygonum aviculare* L: Two sheep were fed exclusively on this plant at an average of 126 g/kg/d[2] for 50 d.
4. *Lythrum hyssopifolium* L: One sheep received 4,3 g/kg dry plant per day for 20 d[6].

Plants numbered (1) and (2) were stored in the fresh form in closed plastic bags in a refrigerated room at 2°C for up to 5 d without wilting. The plants were chopped fine in a blender, mixed with water and dosed by stomach tube.

Plant number (3) was collected daily and fed to the sheep in the fresh form.

Plant number (4) was dried, milled into powder and dosed by stomach tube after mixing with water.

Plant administered with adverse effects

A. arvensis: The soft parts of the plant were separated from the hard stems. These soft parts were mixed in a blender and administetred by stomach tube to three sheep in succession. The dry plant was dried in the shade, milled into powder and dosed by stomach tube after mixing with water. These sheep were kept on a mixed grass pasture together with two control sheep.

The dosing regimen is set out in Table 1.

DESCRIPTION AND DISTRIBUTION OF *A. ARVENSIS*:[3]

Family: Primulaceae.

Common names: Bird's eye, Pimpernel, Poor man's

Table 1: DOSING TRIALS WITH *A. ARVENSIS*

Exp. Animal	Age (months)	Initial live mass (kg)	Dosing regimen (g/kg/d)	Total mass dosed (kg)	Number of doses given	Period dosed (d)	Duration of experiment (d) i.e. from first dose to death or slaughter
Sheep 1	5	25	20 (green plant)	3,5 (green plant)	7	8	9
Sheep 2	5	25	20 (green plant)	2,0 (green plant)	4	6	7
Sheep 3	6	35	4 (green plant)	1,54 (green plant)	11	21	
			2,15 (dry plant)	1,05 (dry plant)	14	21	
			4,2 (dry plant)	1,05 (dry plant	7	9	55

Sheep 2 died, but sheep 1 and 3 were slaughtered while *in extremis*.

weatherglass, Red Chickweed, Roode muur, Rooimuur, Scarlet pimpernel, Shepherd's calender, Shepherd's delight, Shepherd's weatherglass. It is an introduced species into the Republic of South Africa[6].

Fig. 1. *Anagallis arvensis* L. Reproduced from *"Common Weeds in South Africa"*[3].

Description: It is a small plant growing about 100–300 mm in height and can easily be overlooked. The plant is prostrate to suberect, has slender roots, much branched four-angled stems and is an annual herb.
Leaves: Opposite, sessile, clasping at the base, ovate, up to 150 mm long, 120 mm broad, margins entire, narrowly revolute, surfaces glabrous, bright green.
Flowers: Solitary, axillary, on slender pedicles about 10 mm long, elongating and recurring in fruit, calyx green, lanceolate-acuminate, corolla spreading, up to 150 mm diameter bright blue, brick red or pink.
Fruit: Globose, glabrous capsules about 5 mm diameter, brownish, membranous, opening by transverse slits, so that the upper half falls off as a cap, one-celled, many-seeded with free central placentas.
Seeds: Brown, sharply three-angled, 1 mm long, surface densely and minutely tuberculate.
Distribution: Common throughout South Africa. A native of Europe that is now a cosmopolitan weed. It has been known in South Africa since the middle of the 19th century. Commonly found in gardens, roadsides and waste places[3].

RESULTS OF INVESTIGATIONS OF NATURAL AND EXPERIMENTAL DISEASE

The results are a composite picture of both natural and experimental disease.

Clinical symptoms

Morbidity and mortality are the same, as all the animals which had become ill, died. In Tulbagh 40 out of 239 died, in Caledon 25 out of 170.

Affected sheep walk slowly, with a stiff gait and stop grazing. The body temperature remains within normal limits except for the terminal stage when it drops rapidly. Further symptoms are dyspnoea, leg weakness, depression, recumbency, coma and death which usually occur within 24–36 h of appearance of first symptoms.

Two sheep, in a state of coma, got to their feet and walked about within 30 min after 80 mℓ MFC solution (May Baker)* had been injected subcutaneously. This improvement was only temporary as they died within the next 12 h.

Chemical pathology

Biochemical analyses of the blood of the experimental sheep were done about every 3 d and on the day of death or slaughter. No changes could be found in the blood until clinical symptoms of illness were evident, i.e. about 24 h before death. These final analyses on the three experimental sheep, together with analyses from three clinically ill field cases, are presented in Table 2. In all 6 cases the blood urea nitrogen levels were above 75 mg/100 mℓ, the upper limit of the test method used. The plasma magnesium levels were increased in all 6 sheep and the plasma calcium levels were significantly decreased in all sheep except No. 2.

Table 2: BLOOD ANALYSES ON DAY OF DEATH

	mg/100 mℓ				g/100 mℓ	%
Sheep No.	P	Mg	Ca	Bun	TPP	H/C
1 Experimental disease	2,7	4,0	6,8	75+	5,8	43
2 Experimental disease	6,6	5,6	9,8	75+	5,1	26
3 Experimental disease	3,8	3,7	6,9	75+	6,0	33,5
4 Natural disease	5,3	4,5	6,1	75+	5,2	33
5 Natural disease	6,5	6,6	6,6	75+	6,6	37
6 Natural disease	7,2	5,8	5,9	75+	6,2	38

P: Phosphorus, Mg; Magnesium, Ca: Calcium, Bun: Blood urea nitrogen, TPP: Total plasma protein, H/C: haematocrit.

Pathology

Since the gross pathological and histopathological lesions found in the three experimental cases were similar to those found in the natural cases, no distinction will be made in describing the lesions of the two groups.

Macroscopic pathology

At autopsy the following lesions were found:
Subcutaneous oedema, especially along the ventral abdominal wall, ascites (variable amounts of up to 12 ℓ clear yellowish or reddish fluid), severe perirenal oedema, hydrothorax, oedema and congestion of the lungs, petechial and ecchymotic haemorrhages in the

*Containing calcium, magnesium, phosphorus and dextrose.

subcutis, kidney cortex and beneath the epicardium. In most cases the contents of the abomasum, and of the small and large intestines were abnormally fluid in consistency; in some cases there was oedema of the submucosa of the abomasum and of the mesentery.

The most characteristic lesions of the disease, however, were found in the kidneys. There was severe nephrosis manifested by a light reddish brown to very pale grey colour and numerous disseminated petechiae throughout the cortex (Fig. 2). There was no change in the size of the kidneys.

Fig. 2. Kidney of affected sheep.

Histopathology

Significant lesions were confined to the kidneys and in all cases consisted of a severe toxic nephrosis. The glomeruli were relatively unaffected and had undergone only mild vacuolar changes. Most of the proximal convoluted tubules had undergone coagulative necrosis and partial desquamation of the epithelium. In some cases, particularly some of the field cases and experimental Sheep 3, variable degrees of tubular regeneration of parts of the proximal convoluted tubules were observed.

The distal convoluted tubules had fairly severe fatty changes of the lining cells and contained variable numbers of cellular and protein casts. Intratubular haemorrhage of varying intensity, and sometimes quite extensive, had occurred and large amounts of pigment which varied from dark greenish brown to pale grey-brown in the more longstanding cases, were found in the epithelial cells of the proximal and distal convoluted tubules as well as in cellular casts. It stained positively for iron by the Prussian blue method and was thus interpreted as being haemosiderin. It is assumed that this pigment was formed by the breakdown of haemoglobin following intratubular haemorrhage. Most cases had some degree of interstitial oedema with some fibroplasia in several field cases and in Sheep 3.

Apart from a fair number of cellular and protein casts in the lumen of the tubules, the renal medulla was relatively unaffected.

DISCUSSION

The clinical signs, and especially the macroscopic and histopathological lesions of the kidneys produced in the experimental sheep dosed with *A. arvensis*, were indistinguishable from those found in affected sheep in the two field outbreaks. It is therefore concluded that this plant was the cause of the field deaths.

There is no doubt that the plant toxin causes a specific destruction of the renal tubules without significantly affecting other organs. The result is that the animals show no clinical symptoms until shortly before death when renal malfunction apparently becomes critical and uraemia develops. It is clear that the dose of toxic material ingested determines how long it will take for fatal kidney damage to develop. Thus most of the field cases took 14 d or longer to develop fatal kidney lesions, whereas the first two experimental cases, which were given high doses, took 9 and 7 d respectively; these lacked the more chronic lesions of fibroplasia and tubular regeneration. In order to produce a more chronic case, resembling the field cases more closely, the third experimental sheep was given considerably lower doses, resulting in a course of 55 d.

A factor which played a part in producing this condition was the extraordinary heavy rains, which fell in all Winter Rainfall districts, during the summer of 1976/1977 (Table 3).

Table 3: OFFICIAL RAINFALL FIGURES (IN MM) AS OBTAINED FROM FARMS IN THE SAME AREA

	Tulbagh	Average	Caledon	Average
Nov. 1976	40,1	15,2	38,8	19,4
Dec. 1976	75,9	21,6	27,2	11,4
Jan. 1977	31,4	7,5	7,2	10,8
Feb. 1977	21,8	6,5	58,5	5,1
March 1977	16,0	16,0	15,2	13,8

These good rains undoubtedly enhanced the growth of the *A. arvensis* together with other summer growing forage plants. Watt & Breyer-Brandwÿk[6] state that *A. arvensis* is usually untouched in pasture, but under these conditions it would appear that the plant became highly palatable and was readily eaten by sheep. These authors mention that the plant produces gastoenteritis in the dog and horse, that it produces diuresis, when eaten in quantity and is narcotic to a degree sufficient to class it as a poisonous plant, but they make no mention of it causing renal pathology in sheep.

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BOOK REVIEW

BOEKRESENSIE

VIRUSES OF VERTEBRATES

C. ANDREWES, H.G. PEREIRA & P.WILDY 4TH ED.
Baillière Tindall, London 1978
pp. iv + 421, Tabs 13. Publ. Price not stated

With the continuing advancement of our knowledge of animal viruses it is not surprising that the fourth edition of this book has now been published. In this edition the entire text has been completely revised and updated, adding not only additional information on the physico-chemical characters of viruses, but also incorporating the decisions of the International Committee for the Taxonomy of Viruses to place all described virus genera within families. This book, as its predecessors, is written in a well-organised and systematic format in which each virus is dealt with by describing its characteristics, antigenic properties, cultivation, pathogenicity and pertinent aspects of epidemiology and control of the disease which it produces. While this book may be intended as a work of reference for the virologist, or the student in virology, the text is presented in a form which could be appreciated by the clinician and student interested in the more applied aspects of clinical virology. For the specialist this book is extensively referenced and a wealth of information is available for those concerned with further study of the subject. The thirteen tables are primarily intended to summarise data and to set out the classification of selected groups of viruses.

As with previous editions, this book can be recommended without reservation as a concise, informative and indispensable source of reference in the study of animal viruses.

P.G.H.

THE COMPARATIVE ANTIMICROBIAL SENSITIVITY OF *ESCHERICHIA COLI* ISOLATED FROM COLISEPTICAEMIC BROILERS

S.B. BUYS*, L. COETZEE† and P. VAN DER WALT*

ABSTRACT: Buys S.B.; Coetzee L.; Van der Walt P. **The comparative antimicrobial sensitivity of *Escherichia coli* isolated from colisepticaemic broilers.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 325–326 (En) Vet. Res. Inst., 0110 Onderstepoort, Rep. of South Africa.

The standardisation of a method to perform antibiograms using Meuller Hinton agar routinely is described. It was found that from 1973 to 1975 the resistance of *E. coli* to oxytetracycline decreased from 49% to 32,5% and to sulphonamides from 49% to 42,5%. Resistance to furazolidone increased from 12% to 22%. No dramatic changes in the resistance to neomycin and chloramphenicol were found.

INTRODUCTION

Some countries, including South Africa, instituted statutory control over the availability of antimicrobial drugs to minimize the possible induction of microbial drug resistance and other hazards resulting from the indiscriminate use of such drugs.

In terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36/1947) the Registrar has advised that only watersoluble sulphonamides and nitrofurans may be sold without a veterinary prescription for use in poultry as from September 30, 1973. The purpose of the regulation, as with the Swann committee[5] recommendations, is to control the incidence of antimicrobial resistant bacteria in farm animals. It was therefore decided to survey the antimicrobial sensitivity of strains of *Escherichia coli* isolated from broilers, suffering from colisepticaemia and presented for diagnosis at the Veterinary Research Institute, Ondestepoort, in order to note any trends in the antimicrobial sensitivity pattern of *E. coli* before and after amendment of the Act.

MATERIALS AND METHODS

Source and isolation of *E. coli*

Specimens were taken from 161 outbreakes of colisepticaemia; 41 broiler flocks during 1973, from 80 flocks in 1974 and from 40 flocks in 1975.

These specimens were taken from affected airsacs or the pericardial sacs of freshly-killed colisepticaemic birds, using sterile cottonwool swabs. The samples were streaked out on MacConkey agar plates (Oxoid) and incubated overnight at 37°C.

Antimicrobial sensitivity assays

The technique used for the antibiograms was standardized according to the guidelines given in a report of an international collaborative study on the testing for antimicrobial sensitivity[2].

For the antibiograms Meuller Hinton agar (MHA) (Difco) and Isotonic Sensitest Agar (ISA) (Oxoid) was poured into 75 mm plastic Petri dishes to a depth of 4 mm. During 1973 all antibiograms were done on MHA and ISA, while antibiograms during 1974 and 1975 were done only on MHA.

Oxoid Multodiscs with a diameter of 6 mm with the following drug concentrations were used (Smith, H.W., personal communication): sulphafurazole – 100 μg; oxytetracycline – 50 μg; chloramphenicol – 50 μg; furazolidone – 15 μg; neomycin – 30 μg. The discs were stored at –20°C. Thirty min before use they were removed and left at room temperature to equilibrate[2], which prevented water from condensing on the discs.

A single *E. coli* colony was picked up with a platinum loop, suspended in serum broth and incubated for 24 h at 37°C. The broth culture was then diluted to 5 x 10^{-3} with saline and 0,7 mℓ was used to flood the agar plates, which were at room temperature. The plates were left to stand at an angle for 5 min and any excess fluid was drawn off aseptically. The sensitivity discs were firmly pressed onto the agar with sterile forceps. The plates were left for 30 min at room temperature and then incubated overnight at 37°C. The diameter of the zone of inhibition was measured in mm. In the case of sulphonamides, slight growth (80% or more inhibition) was disregarded and the margin of heavy growth regarded as the edge of the zone of inhibition[1]. With all the other antimicrobial drugs the zones were measured to the point where a sharp diminution of growth was apparent[2].

To evaluate the extent of inhibition, zones were compared with a standard sensitive reference *E. coli* strain (NCTC 10418)[3].

a. *Sensitive:* Zone diameter equal to or larger than that of the control zone.
b. *Moderately sensitive:* Zone diameter at least 4 mm smaller than that of the control.
c. *Resistant:* Zone diameter smaller than 10 mm (disc diameter 6 mm).

RESULTS

The sensitivity of *E. coli* NCTC 10418

The sensitivity of *E coli* NCTC 10418 was determined on both MHA and ISA. The results are given in Table 1. It is evident that the extent of inhibition of the reference strain differed on the two media. This was particularly noticeable with neomycin, where the inhibition zone on MHA was 16 mm compared to 24 mm on ISA.

Effect of medium on sensitivity patterns of field isolates of *E coli.*

Differences between the results obtained with MHA and ISA also influenced the results obtained with the field isolates. Resistance to neomycin was observed in

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Table 1: A COMPARISON BETWEEN THE SIZE OF THE ZONE OF INHIBITION OBTAINED ON MEULLER HINTON AGAR (MHA) AND ISOTONIC SENSITEST AGAR (ISA) AGAINST THE STANDARD *E. COLI* REFERENCE STRAIN NCTC 10418

Antimicrobial drug	Inhibition zone in mm	
	MHA	ISA
Sulphafurazole	26	28
Oxytetracycline	26	22
Chloramphenicol	26	26
Furazolidone	26	28
Neomycin	16	24

7% of the 41 isolates made during 1973 and tested on both media. On ISA, which gave the greater zone of inhibition with neomycin (Table 1), the sensitive cultures could be subdivided into 73% sensitive and 20% moderately sensitive, while 93% of the same *E. coli* cultures were sensitive using MHA. This confirms Garrod & Waterworth's[3] recommendation that the drug concentration in the discs should be high enough to give a zone diameter of 25 to 30 mm for a sensitive organism, which ensures that moderately sensitive organisms are also identified.

The sensitivity of field isolates of *E. coli* isolated on Meuller Hinton agar

The results of the antibiograms with *E. coli* isolated from 1973 to 1975 from 161 flocks suffering from colisepticaemia are summarised in Table 3. The resistance to oxytetracycline decreased from 49% in 1973 to 32,5% in 1975 and to sulphonamides from 49% in 1973 to 42,5% in 1975. Resistance to furazolidone increased from 12% in 1973 to 22% in 1975. There was no significant change in resistance to neomycin and no evidence of resistance to chloramphenicol was found.

DISCUSSION

There was a close resemblence between the results obtained by Heller & Smith (1973)[4] and the 1975 results obtained in this laboratory. The greatest difference occurred with sulphonamides, where Heller & Smith (1973) found 83% resistance compared to our 42% in 1975. No resistance to chloramphenicol was found, as it was not being routinely prescribed for colisepticaemia at the time this survey was undertaken.

The increase in resistance to furazolidone from 12% in 1973 to 22% in 1975 was not surprising, considering the 1973 figures (Table 2) which show that 85% of the isolates were moderately sensitive. The possible reason for the increase in resistance to furazolidone might be that water soluble nitrofurans can be obtained without a prescription and that greater use is made of this drug than of those which are prescribed.

Regular investigations of this nature should be conducted to assist in the evaluation of the success of statutory control measures on the use of antimicrobial drugs.

Table 3: CHANGES IN SENSITIVITY PATTERNS OF *E. COLI* ISOLATED FROM 1973 TO 1975 AND TESTED ON MHA

Antimicrobial drugs	Resistant					
	1973		1974		1975	
	No of isolates	%	No of isolates	%	No of isolates	%
Sulphafurazole	21/41	49	30/80	37.5	17/40	42.5
Oxytetracycline	21/41	49	28/80	35	13/40	32.5
Chloramphenicol	0/41	0	0/80	0	0/40	0
Furazolidone	5/41	12	28/80	35	9/40	22
Neomycin	3/41	7	7/80	9	4/40	10

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Table 2: EFFECT OF TEST MEDIUM ON ANTIMICROBIAL SENSITIVITY ASSAYS

Antimicrobial drugs	Resistant				Moderately sensitive				Sensitive			
	MHA		ISA		MHA		ISA		MHA		ISA	
	No of isolates	%	No of isolates	%	No of isolates	%	No of isolates	%	No of isolates	%	No of isolates	%
Sulphafurazole	21/41	49	21/41	49	4/41	10	2/41	5	16/41	41	18/41	46
Oxytetracycline	21/41	49	21/41	49	9/41	22	8/41	20	11/41	29	12/41	31
Chloramphenicol	0/41	0	0/41	0	8/41	20	9/41	22	33/41	80	32/41	78
Furazolidone	5/41	12	5/41	12	35/41	85	33/41	81	1/41	3	3/41	7
Neomycin	3/41	7	3/41	7	0/41	0	8/41	20	38/41	93	30/41	73

THE CURRENT STATUS OF RESISTANCE TO ORGANOPHOSPHORUS IXODICIDES BY THE BLUE TICK, *BOOPHILUS DECOLORATUS* (KOCH) IN THE REPUBLIC OF SOUTH AFRICA AND TRANSKEI

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ABSTRACT: Baker J.A.F.; Miles, Janet O.; Robertson, Wendy D.; Stanford G.D.; Taylor R.J. **The current status of resistance to organophosphorus ixodicides by the Blue tick, *Boophilus decoloratus* (Koch) in the Republic of South Africa and Transkei.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 327–333 (En) Kwanyanga Res. Stn, Coopers (SA) (Pty) Ltd, P.O. Box 5034, 5208 Greenfields, Cape Province, Rep. of South Africa.

In a four year survey 253 isolates of *Boophilus decoloratus* from the Republic of South Africa and Transkei were tested in the laboratory for their susceptibility to certain organophosphorus ixodicides.

Fifty-seven of these isolates were susceptible to organophosphorus compounds, 88 isolates showed a range of susceptibility between that of the susceptible laboratory strain and a strain having a resistance spectrum with similar characteristics to that of the Berlin strain of *B. decoloratus,* and 104 isolates showed degrees of resistance greater than that for the Berlin type strain.

A field trial confirmed degrees of resistance shown in the laboratory to the organophosphorus ixodicides benoxophos, chlorfenvinphos, dioxathion, dicrotophos, quintiofos and chlorfenvinphos/dioxathion.

INTRODUCTION

Resistance to organophosphorus ixodicides in *Boophilus decoloratus* in South Africa was first recorded in 1967 by Shaw, Thompson & Baker[5], whose studies indicated that the resistance encountered in this, the Berlin strain, was of a type comparable to that of the Ridgelands strain of *Boophilus microplus* described by Roulston & Wharton[3] from Australia.

Since then the use of organophosphorus ixodicides for the control of *B. decoloratus* and other tick species in South Africa has been increasing steadily.

Prior to the appearance of Berlin type resistance, the only cholinesterase-inhibiting tick control compounds commercially available were coumaphos, carbophenothion, diazinon, dioxathion and the carbamate, carbaryl. Subsequently bromophos-ethyl, phosphamidon and chlorfenvinphos (1967), a composite chlorfenvinphos-/dioxathion formulation and quintiofos (1968), dicrotophos (1970) and benoxophos (1971) have been marketed[2].

With the exception of phosphamidon, carbophenothion and benoxophos, all these compounds have remained in use until the present time. Concomitant with the increase in usage of organophosphorus chemicals for tick control has been a spectacular decline in the use of arsenic and camphechlor on their own. This is particularly true in those regions of South Africa where *B. decoloratus* occurs in an enzootic situation and may be assumed to be partially due to the reduction in efficacy of these compounds against this tick species.

Coumaphos, diazinon or dioxathion are often added to arsenical dipwashes, whilst bromophos-ethyl, chlorfenvinphos, dioxathion or quintiofos are used in combination with camphechlor. Indications are that few, if any, strains of *B. decoloratus* now exist in cattle-raising areas of the country which have not had some degree of exposure to one or more of the cholinesterase-inhibiting compounds.

Mounting evidence from the field in the ten year period since the localized appearance of the Berlin strain in the Eastern Cape province strongly suggests that resistance to organophosphorus compounds has become much more widespread and more intense. In the course of a survey of organophosphorus-susceptibility in *B. decoloratus* undertaken over the past four years a number of field isolates examined showed levels of resistance significantly greater than that recorded for the Berlin strain.

Both the extent and the degree of resistance have been investigated further.

METHODS

Comparative laboratory tests on larvae were undertaken and in addition, a field hand-spraying trial was carried out. Details of the methods used were:

Unfed larvae

The technique used was that described by Shaw[4] and later modified to include a longer holding period for the larval ticks after treatment[6]. A further modification to this technique was used in this work whereby one operator carried out the test in duplicate from a common reservoir of treated larvae, as compared to two operators conducting tests simultaneously. This was necessary due to the large amount of larval material required to be tested, as a considerable saving in operator time is achieved by this method.

The standard test ixodicide used was dioxathion. Where sufficient larvae were available or where the isolate was considered to be of sufficient interest to warrant further investigation, chlorfenvinphos was also included.

Isolates showing less susceptibility than the Kwanyanga strain to the test ixodicides were grouped into two categories: (i) those isolates that showed a range of susceptibility between that of the Kwanyanga strain and the Holmdene (= Berlin) strain, (ii) those isolates that showed degrees of resistance greater than that for the Holmdene (= Berlin) strain. The data used as a basis for this selection were the LC_{99}(%) values obtained for the Holmdene strain for either dioxathion or chlorfenvinphos. Test data for the latter isolates are presented in the results. The remainder are listed only.

A comparison of the susceptibility of larval offspring of five strains to a number of different chemicals was also made:

(i) the known organophosphorus-sensitive Kwanyanga laboratory reference strain, (ii) the Holmdene strain from the Ixopo District, Natal, which matched very closely the resistance spectrum described for the Berlin

strain[5], (iii) the Three Breezes strain and (iv) the Gulu strain, both from the East London District, Cape Province and known to be resistant to organophosphorus chemicals, (v) the Deelkraal strain from the Potgietersrust District, Transvaal, which had a recent history of resistance to a variety of organophosphorus ixodicides in the field.

Field trial

Investigations were undertaken on the Three Breezes and Gulu properties.

Counts of *B. decoloratus* larvae, nymphae and adults recovered from predetermined neck site areas by the scraping technique of Whitnall, Thorburn *et al*[8] and later modified[1] in respect of the scraping area rotation, were routinely made from treated and untreated control animals.

A weekly interval of treatment was practised on both properties. At Three Breezes, however, this interval was interrupted to include a shortened interval cycle of treatments of either 4 or 5 d for a 35 d period within the 17 week duration of the trial.

Treatments were by hand spraying, using the method described by Baker, Stanford & Taylor[1]. Groups of three cattle were used. At Three Breezes the treatment groups were:
(i) 0,05% dioxathion, (ii) 0,05% dicrotophos, (iii) 0,05% benoxophos, (iv) 0,02% quintiofos, (v) 0,025% chlorfenvinphos/ 0,025% dioxathion, (vi) 0,005 amitraz. At Gulu the treatment groups were: (i) 0,05% dioxathion, (ii) 0,05% dicrotophos, (iii) 0,05% chlorfenvinphos, (iv) 0,025% chlorfenvinphos/ 0,025% dioxathion, (v) 0,05% bromophos-ethyl, (vi) 0,005% amitraz.

The criterion of efficiency used, once the initial tick infestations were eliminated, was the ability of treatments to prevent tick development beyond the larval stage. Limitations imposed on larval feeding were also considered.

Selection of the ixodicides used was based primarily on the response of *B. decoloratus* strains from these two properties in the larval test. The larvae from Three Breezes had shown a greater resistance than that of the Berlin type, whilst at Gulu it was greater than that at Three Breezes.

RESULTS

Unfed larvae

The results expressed as LC_{99}(%) values are the product of at least two duplicates for each observation. The 95% fiducial limits for these values are also shown. The data were analyzed by computer using a probit analysis programme.

The susceptibilities of 253 field isolates of *B. decoloratus* were determined. A range of values at the LC_{99}(%) level are compared with those obtained for the Kwanyanga reference strain and factors of resistance thus obtained are given. Isolates considered as dioxathion resistant are those having LC_{99}(%) values equal to, or greater than, that for the Holmdene (= Berlin) strain. Isolates considered as chlorfenvinphos resistant are those having LC_{99}(%) values equal to, or greater than that for the Gulu strain.

Fifty-seven isolates were as susceptible as the Kwanyanga strain (Table 1), and a further 88 isolates showed a range of susceptibility between that of the Kwanyanga strain and the Holmdene (= Berlin) strain (Table 2). The remaining 104 isolates were to varying degrees less susceptible than the Holmdene (= Berlin) strain (Table 3).

Table 1: TOTALS OF FIELD ISOLATES OF *BOOPHILUS DECOLORATUS* SHOWING NO REDUCTION IN SUSCEPTIBILITY TO ORGANOPHOSPHORUS COMPOUNDS

Region	Number of isolates tested
Cape	7
Ciskei	2
Transkei	13
Orange Free State	4
KwaZulu	8
Natal	9
Lebowa	2
Transvaal	9
Venda	3

The geographical distribution of all isolates is shown in Fig. 1.

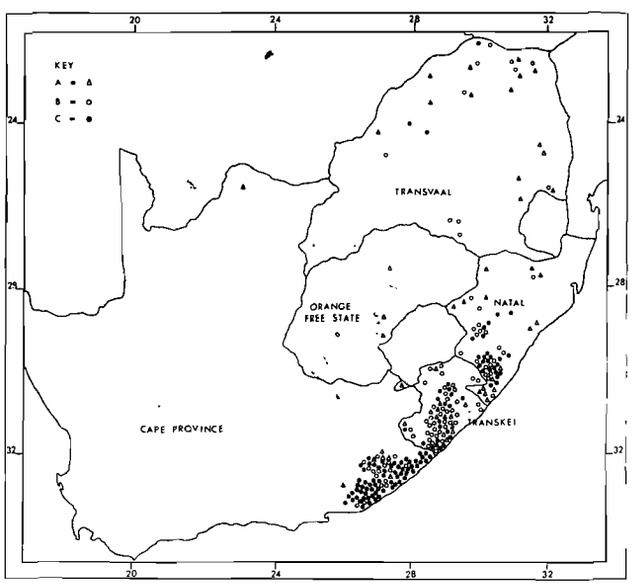

Fig.1. Geographical distribution of the organophosphorus susceptible and resistant strains of *B. decoloratus* recorded in Tables 1, 2, 3 and 4.
A: Organophosphorus susceptible strains; B: Strains showing a range of susceptibility between that of the susceptible reference strain and the Holmdene (= Berlin) strain; C: Strains showing degrees of resistance greater than that for the Holmdene (= Berlin) strain.

The susceptibility of larvae of the Kwanyanga strain to a range of ixodicides is compared to that of larval offspring of strains from Holmdene, Three Breezes, Gulu and Deelkraal in Table 4. The field strains exhibited high degrees of resistance to benoxophos and carbophenothion, whilst no resistance was shown to bromophos-ethyl, chlorpyrifos and fenitrothion. Varying levels of susceptibility were obtained towards the remaining ixodicides tested, and most resistant strain in all instances being that from Gulu. Cross-resistance to benoxophos, carbophenothion, diazinon, dicrotophos,

Table 2: TOTALS OF FIELD ISOLATES OF *BOOPHILUS DECOLORATUS* SHOWING A RANGE OF SUSCEPTIBILITY TO ORGANOPHOSPHORUS COMPOUNDS BETWEEN THAT OF THE KWANYANGA AND HOLMDENE (= BERLIN) STRAINS

Region	Number of isolates tested
Cape	3
Ciskei	14
Transkei	39
Orange Free State	2
KwaZulu	2
Natal	17
Transvaal	9
Venda	2

ethion and quintiofos occurred in the strain at Three Breezes, which was resistant to dioxathion, and in the strain at Gulu, which was resistant to dioxathion and chlorfenvinphos. Bromophos-ethyl was 2× to 4× more effective against strains of organophosphorus-resistant ticks than against susceptible strains. This negative correlation has been discussed by Shaw, Cook & Carson[6].

Field trial

At Three Breezes (Fig. 2) benoxophos and quintiofos did not control *B. decoloratus* when treatment intervals were 4 or 5 d apart. Dicrotophos and dioxathion successfully prevented nymphal or adult development when reduced treatment intervals were used, but only partial control of nymphae was achieved by dicroto-

Table 3: THE SUSCEPTIBILITY OF 100 FIELD ISOLATES OF LARVAE OF *BOOPHILUS DECOLORATUS* TO DIOXATHION AND 55 FIELD ISOLATES OF LARVAE OF *BOOPHILUS DECOLORATUS* TO CHLORFENVINPHOS

Ixodicide	Region	No. of isolates tested	Range of LC_{99}(%)'s	Origin of isolate	LC_{99}(%)	95% Fiducial Limits		F.O.R.	No. of isolates considered resistant
						Lower	Upper		
Dioxathion	Kwanyanga		Reference strain		0,00063	0,0004	0,00064		
	Cape	25	Lowest	East London	0,012	0,008	0,024	19	
			Median	East London	0,06	0,033	0,26	95	25
			Highest	Kingwilliamstown	6,6	0,48	99	10000	
	Ciskei	36	Lowest	Middledrift	0,0089	0,0045	0,032	14	
			Median	Middeldrift	0,025	0,012	0,13	41	36
			Highest	Keiskammahoek	0,69	0,21	4,1	1100	
	Transkei	17	Lowest	Idutywa	0,0073	0,0052	0,011	12	
			Median	Tsolo	0,03	0,021	0,046	48	17
			Highest	Willowvale	0,43	0,13	3,1	683	
	Natal	20	Lowest	Ladysmith	0,0066	0,0039	0,021	10	
			Median	Ixopo	0,031	0,015	0,094	49	20
			Highest	Ixopo	7,5	0,4	99	12000	
	Transvaal	2	Lowest	Messina	0,04	—	—	200	
			Highest	Waterberg	2,8	0,54	99	4444	2
Chlorfenvinphos	Kwanyanga		Reference strain		0,0018	0,0014	0,0019		
	Cape	19	Lowest	Komga	0,002	0,0019	0,0038	1,2	
			Median	East London	0,0073	0,005	0,013	4,1	1
			Highest	East London	1,0	0,18	99	555	
	Ciskei	16	Lowest	Keiskammahoek	0,0049	0,0035	0,0088	2,7	
			Median	Middeldrift	0,0069	0,006	0,0083	3,8	0
			Highest	Peddie	0,013	0,011	0,015	7,2	
	Transkei	10	Lowest	Tsolo	0,0045	0,0031	0,013	2,5	
			Median	Xalanga	0,0063	0,0053	0,0076	3,5	1
			Highest	Kentani	0,15	0,024	99	83	
	Natal	10	Lowest	Ixopo	0,0049	0,0042	0,0064	2,3	
			Median	Weenen	0,0059	0,005	0,0076	3,3	0
			Highest	Ixopo	0,016	—	—	8,9	
	Transvaal	1		Waterberg	0,15	0,055	0,84	83	1

F.O.R.: Factor of resistance determined by comparison with the Kwanyanga strain.
—: Fiducial limits not calculated, data heterogeneous.

Table 4: A COMPARISON OF THE SUSCEPTIBILITY OF LARVAE OF THE KWANYANGA, HOLMDENE, THREE BREEZES, GULU AND DEELKRAAL STRAINS OF *BOOPHILUS DECOLORATUS*

Ixodicide	Kwanyanga	Holmdene		Three Breezes		Gulu		Deelkraal	
	LC_{99}(%)	LC_{99}(%)	FOR	LC_{99}(%)	FOR	LC_{99}(%)	FOR	LC_{99}(%)	FOR
Benoxophos	0,004	0,44	110	1,5	375	5,4	1350	5,6	1400
	—	—		—		6,1/99		2,1/8,7	
Bromophos ethyl	0,028	0,0063	–4,4	0,0062	–4,3	0,0083	–3,4	0,016	–1,8
	—	0,0054/0,0078		0,0038/0,016		0,0067/0,011		—	
Carbophenothion	0,0044	0,13	30	4,2	955	2,9	659	3,1	705
	0,0044/0,012	—		2,5/8,2		1,4/8,4		—	
Chlorfenvinphos	0,0018	0,0053	3,0	0,0095	5,3	0,079	44	0,011	6,1
	0,0014/0,0019	0,0034/0,0079		0,0084/0,011		0,046/0,19		0,0079/0,066	
Chlorfenvinphos/ dioxathion	0,0021	0,0093	4,4	0,018	8,6	0,024	11	0,044	21
	0,0008/3,1	0,0051/1,09		0,0092/0,69		0,021/0,028		0,036/0,057	
Chlorpyrifos	0,0005	*		0,0019	3,8	0,0005	1,0	*	
	0,0005/0,0006			0,0011/0,013		0,0004/0,0006			
Diazinon	0,0014	0,023	16	0,022	16	0,21	150	0,053	38
	0,0008/0,0042	—		0,0097/99		0,096/1,3		0,036/0,092	
Dicrotophos	0,14	0,19	1,4	0,32	2,3	0,48	3,4	0,41	2,9
	0,083/0,34	0,088/99		—		0,23/99		0,29/0,78	
Dioxathion	0,00063	0,006	9,5	0,013	21	0,081	129	0,012	19
	0,0004/0,0064	0,0044/99		0,005/0,038		0,054/0,15		—	
Ethion	0,0009	0,004	4,4	0,0067	7,4	0,024	27	*	
	—	—		0,0058/0,0081		0,011/7,9			
Fenitrothion	0,0048	0,013	2,7	0,011	2,3	0,011	2,3	*	
	—	0,011/0,016		0,0063/0,037		0,0052/0,12			
Quintiofos	0,0028	0,025	8,9	0,43	154	1,5	536	0,22	79
	—	—		0,22/2,8		0,87/3,1		—	

Where available, the 95% fiducial limits obtained appear directly below the LC_{99}(%) figures.
FOR = Factor of resistance determined by comparison with the Kwanyanga strain
— = Confidence limits not calculated, data heterogeneous
* = Not tested

phos at a 7 d treatment interval. Dioxathion did not control this tick strain at the weekly interval of treatment. Successful control at 7 d treatment intervals was obtained by chlorfenvinphos/dioxathion and amitraz.

At Gulu (Fig. 3) dioxathion and dicrotophos did not control *B. decoloratus* at a 7 d treatment interval. A partial control of nymphal and adult stages was achieved by chlorfenvinphos and chlorfenvinphos/dioxathion at a weekly interval of treatment, but control of larval feeding was poor. Neither treatment controlled this tick strain when the period between treatments was increased to 14 d. Successful control of larval development was obtained by bromophosethyl and amitraz at weekly treatment intervals and of nymphal development at 14 d treatment intervals.

DISCUSSION

Factors of resistance to certain organophosphorus ixodicides greater than that of the Holmdene (= Berlin) strain are shown for isolates of *B. decoloratus* from Transkei and for the Cape, Natal and Transvaal provinces of South Africa. In addition, Berlin type resistance is shown to occur in strains from the Orange Free State Province of South Africa. With the exception of the Cape Province, these constitute the first records of resistance to this group of ixodicides in these regions.

Confirmation of the laboratory results was obtained in the field trials, both in the range of susceptibility to the ixodicides used, and the levels of resistance encountered. Using the laboratory data obtained from Three Breezes and Gulu alone, it should thus be possible to establish the degree of control likely to result elsewhere in the field from the use of those particular ixodicides.

A highly complex *B. decoloratus* control situation has always existed in South Africa, because of the multiplicity of ixodicides available, ixodicide combinations used and the varying treatment intervals adopted. It is thus of interest to speculate on the possible emergence of simultaneously occurring resistance mechanisms or, at least, some alteration in the pattern of resistance development in this tick compared to that in *B. microplus* in Australia. Both laboratory and field results suggest, however, that the trends of organophosphorus-resistance in South African *B. decoloratus* strains, despite the high levels of dioxathion resistance shown, are similar to those in *B. microplus* and in general may be considered to be at a stage greater than that in the Ridgelands strain, but less than that in the Biarra strain. Shaw *et al*[6] has indicated that the negative correlation factor obtained with bromophos-ethyl in the testing of *Boophilus* larvae characterizes strains so responding as being of the Ridgelands (Berlin) type, but not of the Biarra type. The biochemical nature of this resistance, as well as further laboratory and field investigations of selected field strains, is being investigated.

The significance of treatment interval manipulation as it applies to *B. microplus* control has already been recognised[7]. In these trials the variation in effect of intervals of 4 or 5 d as compared to a weekly interval (Fig. 2), or to a fortnighly interval instead of every seven d (Fig. 3), is clearly shown. In the short term this does offer a practical solution to the selection of an ixodicide after organophosphorus resistance by *B. decoloratus* has been identified. The *in vivo* results also show that various organophosphorus ixodicides afford widely differing degrees of control against resistant strains exhibiting varying levels of resistance.

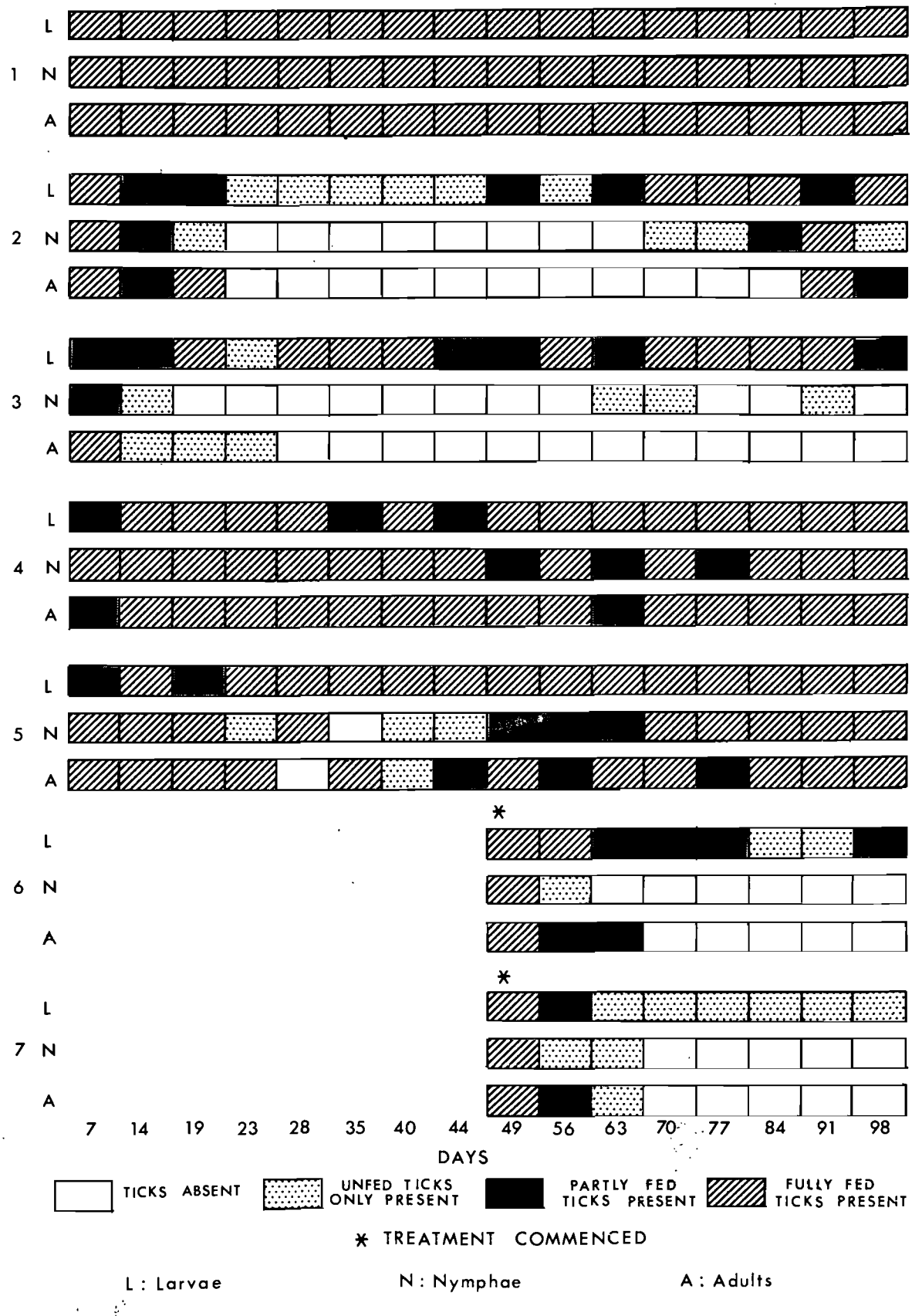

Fig. 2. A comparison of the effect of hand spraying treatments on infestations of *Boophilus decoloratus* on naturally grazed cattle at 'Three Breezes'.
1: Untreated Control; 2: 0,05% dioxathion; 3: 0,05% dicrotophos; 4: 0,05% benoxophos; 5: 0,02% quintiofos; 6: 0,025% chlorfenvinphos/ 0,025% dioxathion; 7: 0,005% amitraz.

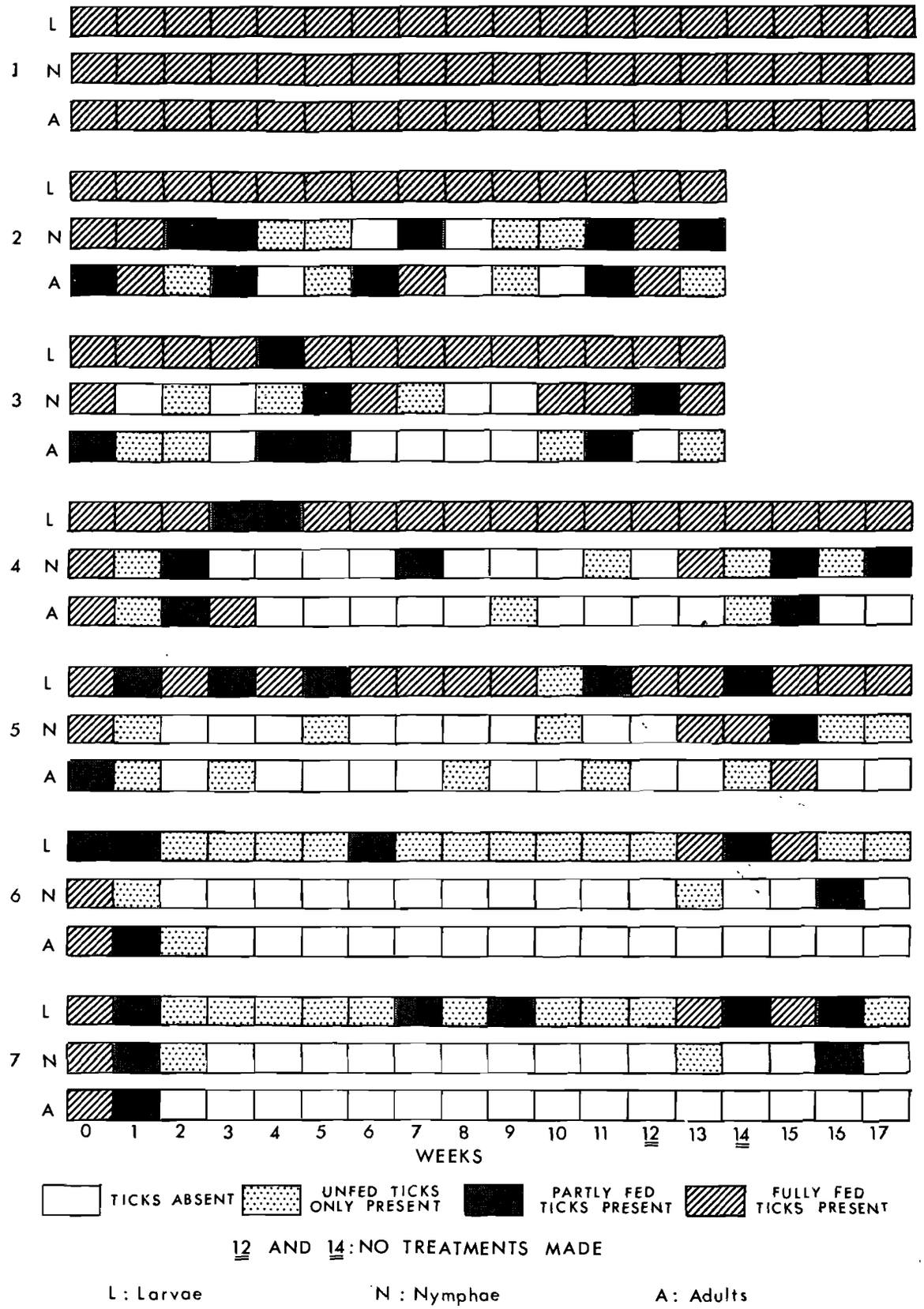

Fig. 3. A comparison of the effect of weekly hand spraying treatments on infestations of *Boophilus decoloratus* on naturally grazed cattle at 'Gulu'.
1: Untreated Controls; 2: 0,05% dioxathion; 3: 0,05% dicrotophos; 4: 0,05% chlorfenvinphos; 5: 0,025% chlorfenvinphos/0,025% dioxathion; 6: 0,05% bromophos-ethyl; 7: 0,005% amitraz.

The efficacy of amitraz and bromophos-ethyl in the field indicates a continuing role for these two compounds in the control of all known organophosphorus-resistant strains of *B. decoloratus* in South Africa, with formulations containing chlorfenvinphos filling a useful role for controlling less resistant strains.

The extent of organophosphorus resistance in South Africa and Transkei is shown to be significant and there can be little doubt that the situation is likely to deteriorate further in the future. The judicious and controlled use of ixodicides from within this group of compounds thus remains of the utmost importance.

ACKNOWLEDGEMENTS

The authors acknowledge with thanks permission to publish the results of tests undertaken on behalf of the Director of Veterinary Field Services, Republic of South Africa and the Director of Veterinary Services, Transkei. Thanks are also given for the technical assistance provided by Miss S.J. Rust.

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BOOK REVIEW — BOEKRESENSIE

PHYSICAL THERAPY FOR ANIMALS: SELECTED TECHNIQUES

ANN H. DOWNER
Charles C. Thomas, Springfield, Illinios, USA, 1978. pp. 186, price not stated

With the preparation of lectures for the DipCurAnim course it became obvious that few works dealing with physical therapy for animals were available. The publishing of this book by Professor Downer is therefore most timely and has been recommended as a textbook for students.

The script is easy to follow and especially useful to persons who have not had specialist training in this particular field and who are required to carry out these procedures in a hospital or private practice. There is, however, a deficiency of schematic instructions as to the treatment of different body parts and species, and more attention could be given to physical therapy for large animals.

Physical therapy is as beneficial to animals as it is to humans but because of the shortage of trained personnel, time, the high price of equipment and also ignorance as to the therapeutic value of physical therapy, it is neglected.

The book is recommended for use by students in the veterinary field and for practicing veterinarians who have already acquired some of the equipment or intend doing so.

S.S. v.d. B.

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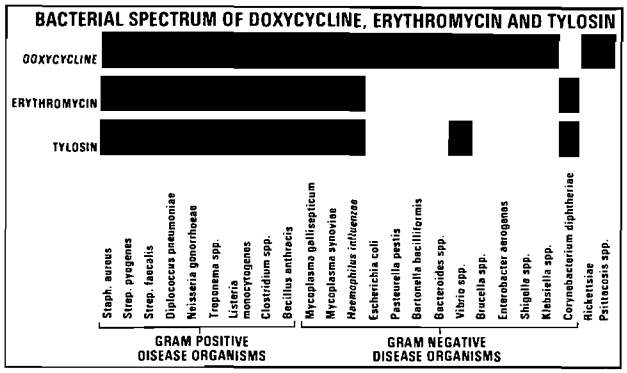

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RESISTANCE TO CERTAIN ORGANOPHOSPHORUS IXODICIDES IN THE BONT TICK, *AMBLYOMMA HEBRAEUM* KOCH, IN THE REPUBLIC OF SOUTH AFRICA AND SWAZILAND

J.A.F. BAKER, JANET O. MILES and WENDY D. ROBERTSON

ABSTRACT: Baker J.A.F.; Miles, Janet O.; Robertson, Wendy D. **Resistance to certain organophosphorus ixodicides in the Bont tick, *Amblyomma hebraeum* Koch, in the Republic of South Africa and Swaziland.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 337–341 (En) Kwanyanga Res. Stn, Coopers (SA) (Pty) Ltd, P.O. Box 5034, Greenfields, 5208 Cape Province, Rep. of South Africa.

A series of *in vitro* trials confirmed resistance in the three-host tick, *Amblyomma hebraeum* Koch, to the organophosphorus ixodicides, dioxathion, chlorfenvinphos, quintiofos, bromophos-ethyl and a dioxathion/chlorfenvinphos combination.

The results of a routine survey showed that a resistance factor of >100× was present in the offspring of ticks in six of 115 field isolates tested. These six isolates were confined to the lowveld areas of the province of Natal, Republic of South Africa, and Swaziland. Ticks in a further 59 isolates were less susceptible than the reference strain.

Resistance was present in all three tick instars.

This is the first recorded resistance to the organophosphorus group of ixodicides by multi-host ticks in Africa.

INTRODUCTION

Resistance in *Amblyomma hebraeum* Koch to arsenic, toxaphene, lindane and DDT in Southern Africa has already been reported[4 6].

In the summer of 1974/75 verbal reports of a failure to successfully control field infestations of this tick, using various organophosphorus ixodicides, were received from the farms Igiana and Mooihoek in the Hlabisa District of the province of Natal, Republic of South Africa, and from Bar R Ranch in the Lubombo District, Swaziland. Field observations showed the presence of engorged larval, nymphal and female ticks, as well as clusters of 30 or more partly engorged female ticks, on regularly dipped cattle 5 d after a previous treatment. The ixodicides used were dioxathion, chlorfenvinphos and a dioxathion/chlorfenvinphos combination. Chemical analyses of the dipwashes revealed them to be above the usage concentrations recommended. On the host, larval *A. hebraeum* can be expected to feed to repletion within 6 to 8 d, nymphs 6 to 9 d and females 6 to 12 d[7]. It is to be expected, therefore, that the engorged ticks observed in each instance were present on the cattle at the time of the previous treatment. Both the presence of engorged female ticks and the clustering of partly engorged female ticks were inconsistent with previous experience with these ixodicides 5 d after treatment[1 2 3 5 11].

Laboratory tests on the larval progeny of tick specimens collected from these three properties all revealed high levels of resistance to the test ixodicide, dioxathion.

In the course of a survey of the susceptibility of *A. hebraeum* to organophosphorus compounds significant variation in the response to certain ixodicides was observed in a further three field isolates out of a total of 115 such isolates tested. The results of these investigations are presented.

METHODS

Comparative laboratory tests on larvae, nymphae and adults, using dioxathion and chlorfenvinphos, were undertaken. Details of the methods used were:

Unfed larvae

The technique used was that described by Shaw[8] and later modified[9] to include a longer holding period for the larval ticks after treatment. A further modification to this technique was used in this work whereby one operator simultaneously carried out the test in duplicate from a common reservoir of treated larvae, as compared to two operators conducting tests simultaneously. This was necessary due to the large amount of larval material required to be tested, as a considerable saving in operator time is achieved by this method.

A comparison of the susceptibility of larval offspring of three strains to a number of different compounds was also undertaken: (i) the known organophosphorus sensitive Kwanyanga laboratory reference strain, (ii) the Bar R Ranch strain from the Lubombo District, Swaziland, (iii) the Hlabisa 78 strain from the Hlabisa District, Natal. Both the Bar R Ranch and the Hlabisa 78 strains had a recent history of resistance to a variety of organophosphorus ixodicides in the field.

Unfed nymphs

The larval offspring of Kwanyanga and Bar R Ranch strains of ticks were fed on the ears of calves and engorged larvae were harvested and randomly sorted into batches of at least 50 ticks. Each batch was placed in 60 mm x 35 mm open-ended coffee-bag paper sachets and the open end heat-sealed with a 2 mm wide flat-tipped soldering iron. The sachets were then suspended from wire hooks in an incubator at 24°C and 80% R.H. Two weeks after nymphal emergence the sachets were individually immersed for 5 sec in 100 mm diameter aluminium foil bowls each containing 50 mℓ of a prepared geometric range of ixodicidal concentrations. Removal of excess wash from the sachets after immersion was facilitated by allowing contact of the bottom edge of the suspended sachets with a 150 mm diameter Whatman's No. Q.1 filter paper for 15 sec. Mortality was assessed after a final 24 h suspension at room temperature, range 20–26,5°C.

Table 1: THE SUSCEPTIBILITY OF 105 FIELD ISOLATES OF LARVAE OF *AMBLYOMMA HEBRAEUM* TO DIOXATHION AND 43 FIELD ISOLATES OF LARVAE OF *AMBLYOMMA HEBRAEUM* TO CHLORFENVINPHOS

Ixodicide	Region	No. of isolates tested	Range of LC_{99}(%)'s	Origin of isolate	LC_{99}(%)	95% Fiducial Limits		F.O.R.	No. of isolates considered resistant
						Lower	Upper		
Dioxathion	Kwanyanga		Reference strain		0,001	0,0009	0,001		
	Cape	5	Lowest	East London	0,0005	0,0004	0,0006	0,5	
			Median	East London	0,0008	0,0006	0,0012	0,8	0
			Highest	East London	0,001	—	—	1,0	
	Transvaal	5	Lowest	Pietersburg	0,0003	0,0003	0,0006	0,3	
			Median	Thabazimbi	0,0004	—	—	0,4	0
			Highest	Barberton	0,0021	0,0011	0,062	2,1	
	Natal	7	Lowest	Ngotshe	0,0004	0,0004	0,0005	0,4	
			Median	Richmond	0,0013	0,0013	0,049	3,0	5
			Highest	Hlabisa	>100	—	—	>100000	
	Transkei	8	Lowest	Willowvale	0,0003	0,0003	0,0005	0,3	
			Median	Kentani	0,0012	0,0006	0,031	1,0	0
			Highest	Kentani	0,0019	0,0012	0,0057	1,9	
	Ciskei	5	Lowest	Victoria East	0,0005	0,0004	0,0006	0,5	
			Median	Victoria East	0,0007	0,0006	0,0008	0,7	0
			Highest	Zwelitsha	0,0012	0,0008	0,0037	1,2	
	KwaZulu	12	Lowest	Ingwavuma	0,0003	0,0003	0,0003	0,3	
			Median	Mapumalanga	0,0015	0,0009	0,016	1,5	0
			Highest	Ubombo	0,0051	0,0034	0,011	5,1	
	Gazankulu	2	Lowest	Malamulele	0,0003	0,0003	0,0003	0,3	0
			Highest	Mahla	0,0006	0,0004	0,0028	0,6	
	Lebowa	18	Lowest	Naphuno	0,0003	0,0003	0,0004	0,3	
			Median	Bolebedu	0,0007	0,0006	0,0011	0,7	0
			Highest	Mokerong	0,0012	0,0011	0,0014	1,2	
	Venda	38	Lowest	Sibasa	0,0003	0,0003	0,0004	0,3	
			Median	Vuwani	0,0034	0,0017	0,025	3,4	0
			Highest	Sibasa	0,013	—	—	13	
	Swaziland	5	Lowest	Manzini	0,0004	0,0003	0,0004	0,4	
			Median	Lubombo	0,0011	0,0006	0,073	1,1	1
			Highest	Lubombo	>100	—	—	>100000	
Chlorfenvinphos	Kwanyanga		Reference strain		0,001	0,0008	0,0015		
	Cape	2	Lowest	East London	0,0016	0,0012	0,0027	1,2	0
			Highest	East London	0,0018	0,001	0,0097	1,8	
	Transvaal	1		Pietersburg	0,0008	0,0008	0,0009	0,8	0
	Natal	4	Lowest	Ngotshe	0,0008	0,0006	0,001	0,8	
			Median	Hlabisa	0,031	0,016	0,13	31	3
			Highest	Hlabisa	>100	—	—	>100000	
	Transkei	2	Lowest	Nqamakwe	0,0009	0,0009	0,0011	0,9	0
			Highest	Willowvale	0,002	0,0013	0,0069	2,0	
	Ciskei	2	Lowest	Victoria East	0,0012	0,0011	0,0013	1,2	0
			Highest	Mdantsane	0,0012	0,001	0,0014	1,2	
	KwaZulu	2	Lowest	Mapumalanga	0,0006	0,0005	0,0056	0,6	0
			Highest	Ubombo	0,0043	0,0023	0,055	4,3	
	Gazankulu	2	Lowest	Mahla	0,0015	0,0007	99	1,5	0
			Highest	Mahla	0,0022	0,0017	0,0031	2,2	
	Lebowa	6	Lowest	Bosbokrand	0,0005	0,0005	0,0006	0,5	
			Median	Mokerong	0,001	0,0007	0,0029	1,0	0
			Highest	Mokerong	0,0019	0,0018	0,0021	1,9	
	Venda	21	Lowest	Sibasa	0,001	0,0009	0,0012	1,0	
			Median	Sibasa	0,0032	0,0029	0,0038	3,2	0
			Highest	Sibasa	0,0074	0,0026	8,9	7,4	
	Swaziland	1		Lubombo	>100	—	—	>100000	1

F.O.R.: Factor of resistance determined by comparison with the Kwanyanga strain.
—: Fiducial limits not calculated, data heterogeneous.

Unfed adults

The nymphal offspring of Kwanyanga and Bar R Ranch strains of ticks were fed on the ears of calves. Engorged nymphae were harvested and randomly sorted into batches of at least 25 ticks. Subsequent pre-treatment, treatment and post-treatment procedures were as described for unfed nymphae with the exception that the size of the sachets used was 75 mm x 75 mm. Sex was determined at the time mortality was assessed.

RESULTS

Unfed larvae

The results expressed as $LC_{99}(\%)$ values are the product of at least two duplicates for each observation. The 95% fiducial limits for these values are also shown. The data were analysed by computer using a probit analysis programme.

The susceptibility of the larval offspring of 105 field isolates of *A. hebraeum* to dioxathion and 43 isolates to chlorfenvinphos are given in Table 1. A range of values at the $LC_{99}(\%)$ level for field isolates from each region are compared with those obtained for the Kwanyanga reference strain and factors of resistance thus obtained are given. Isolates considered as resistant are those for which a history of resistance to dioxathion and chlorfenvinphos in the field is available, and for which $LC_{99}(\%)$ values of >0,03 were obtained.

Sixty-three of the isolates tested against dioxathion and nine of the isolates tested against chlorfenvinphos were as susceptible as the Kwanyanga strain at the $LC_{99}(\%)$ level; 27 of the isolates tested against dioxathion and 21 of the isolates tested against chlorfenvinphos were 1,1× to 2× more resistant; six isolates tested against dioxathion and seven isolates tested against chlorfenvinphos were 2,1× to 3,5× more resistant; one isolate tested against dioxathion was 5,1× and another 13× as resistant; one isolate tested against chlorfenvinphos was 4,3× and another 7,4× as resistant and six isolates tested against dioxathion had factors of resistance of >100x. Three of these last tested isolates also had factors of resistance of >100× to chlorfenvinphos, whilst in a fourth, a 31× factor of resistance was recorded.

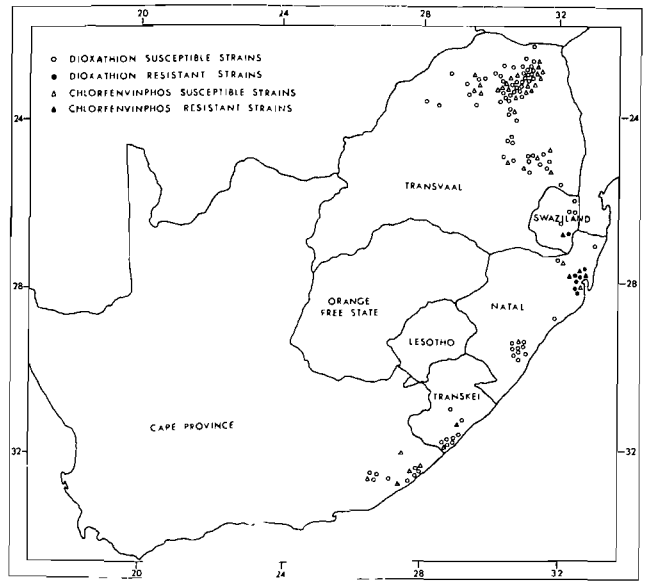

Fig. 1. Geographical distribution of the dioxathion and chlorfenvinphos susceptible and resistant strains of *Amblyomma hebraeum* recorded in Table 1.

The geographical distribution of all isolates is illustrated in Figure 1.

The susceptibility of larvae of the Kwanyanga strain to a range of ixodicides is compared to that of larval offspring of strains from Bar R Ranch and Hlabisa 78 in Table 2. The Bar R Ranch and Hlabisa 78 strains have a high factor of resistance to dioxathion, chlorfenvinphos, dioxathion/chlorfenvinphos combination, bromophos-ethyl and quintiofos, although some variation in their response to chlorfenvinphos is evident.

A comparison of the logarithm dose/probit mortality regression lines using dioxathion, chlorfenvinphos, dioxathion/chlorfenvinphos, bromophos-ethyl and quintiofos for the Kwanyanga and Bar R Ranch strains is illustrated in Figure 2.

Unfed nymphs

The unfed nymphal offspring of the Bar R Ranch strain resisted considerably higher levels of dioxathion and chlorfenvinphos than did those of the Kwanyanga strain (Figure 3).

Table 2: A COMPARISON OF THE SUSCEPTIBILITY OF LARVAE OF THE KWANYANGA, BAR R. RANCH AND HLABISA 78 STRAINS OF *AMBLYOMMA HEBRAEUM* TO VARIOUS ACARICIDES

Chemical	Kwanyanga			Bar R Ranch				Hlabisa 78			
	$LC_{99}(\%)$	95% Fiducial Limits		$LC_{99}(\%)$	95% Fiducial Limits		F.O.R.	$LC_{99}(\%)$	95% Fiducial Limits		F.O.R.
Arsenic	6,8	3,5	25	99	8,1	99	124	9,8	4,6	99	1,4
Toxaphene	0,14	0,1	0,22	53	—	—	379	99	—	—	707
DDT	0,018	0,01	0,08	0,037	0,026	0,059	2,1	0,56	0,25	2,6	31
Lindane	0,0004	—	—	0,007	—	—	18	0,0067	0,0053	0,0092	17
Dioxathion	0,001	0,0009	0,001	>100	—	—	>100 000	>100	—	—	>100 000
Chlorfenvinphos	0,001	0,0008	0,0015	>100	—	—	>100 000	0,031	0,016	0,13	31
Dioxathion/Chlorfenvinphos	0,00047	0,00024	0,041	>100	—	—	>200 000	>100	—	—	>200 000
Bromophos-ethyl	0,095	0,074	0,13	>100	—	—	>1 000	>100	—	—	>1 000
Quintiofos	0,0026	0,0014	0,024	>100	—	—	>40 000	>100	—	—	>40 000

—: Fiducial limits not calculated, data heterogeneous
F.O.R.: Factor of resistance determined by comparison with the Kwanyanga strain

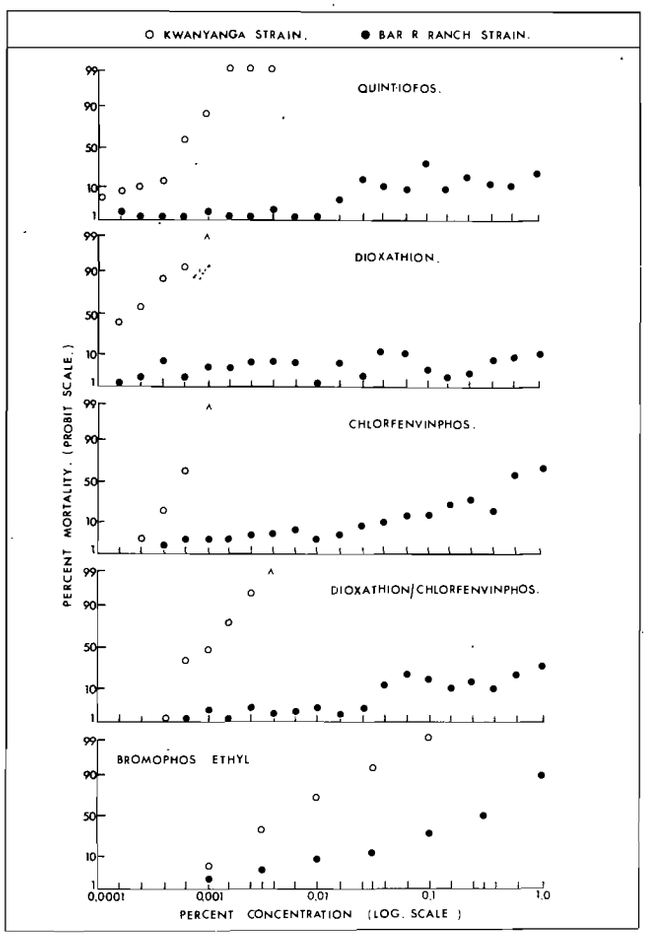

Fig. 2. A comparison of the effect of a range of test concentrations of five different organophosphorus ixodicides on unfed larvae of two strains of *Amblyomma hebraeum.*

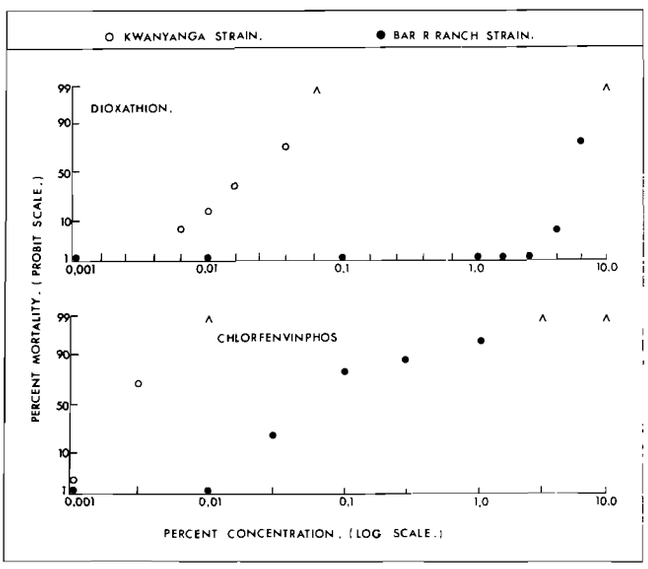

Fig. 3 A comparison of the effect of a range of test concentrations of two different organophosphorus ixodicides on unfed nymphae of two strains of *Amblyomma hebraeum.*

Unfed adults

Unfed male and female ticks bred from the Bar R Ranch strain successfully survived immersion in concentrations of dioxathion and chlorfenvinphos which killed those of the Kwanyanga strain (Figure 4).

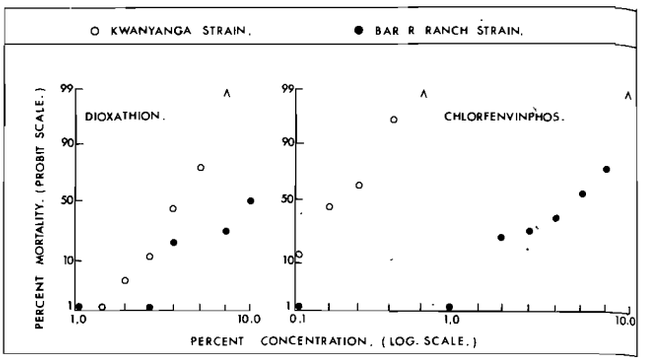

Fig. 4 A comparison of the effect of a range of test concentrations of two different organophosphorus ixodicides on unfed adults of two strains of *Amblyomma hebraeum.*

DISCUSSION

A marked resistance by certain of the isolates of *A. hebraeum* against the organophosphorus ixodicides used in the trial is present and as such constitutes the first record of resistance to this group of ixodicides by multihost ticks in Africa.

Confirmation of the laboratory results is afforded by the field observations at the farms Igiana, Mooihoek and Bar R Ranch and these indicate that resistance by all three stages of *A. hebraeum* to organophosphorus ixodicides occurs in the field.

Although it is not yet clear what the protective mechanism involved in this resistance is, the restricted geographical distribution of the most resistant tick isolates identified suggests the local emergence of a highly resistant genotype.

The survey indicates that ticks with similar levels of resistance are not represented elsewhere, but there can be little doubt that movement of stock from the worst affected areas may cause them to be established in other districts. Additionally, the spread of *A. hebraeum* has been shown to be materially assisted by a wide variety of small animal, bird and reptile life[10], much of which is well represented on most of these farms. It is, therefore, perhaps significant to record that an isolate from Ubombo with a developing level of resistance to dioxathion (5,1×) and chlorfenvinphos (4,3×), was collected from KwaZulu, a region neighbouring Hlabisa.

The difference in the dosage-mortality response to chlorfenvinphos between the Hlabisa 78 strain on the one hand and the Bar R Ranch strain on the other suggests some measure of biochemical variation in these strains. This is being investigated further.

Considerable cross resistance within the organophosphorus group of ixodicides is revealed by the results. Apart from that already demonstrated, further cross-resistance embracing possibly all commercially available organophosphorus ixodicides is likely to occur in respect of the more resistant of the *A. hebraeum* isolates. Field use of the diamidine compound, amitraz, however,has been successful in controlling these ticks.

ACKNOWLEDGEMENTS

The authors acknowledge with thanks permission to publish the results of tests undertaken on behalf of the Director of Veterinary Field Services, Republic of South Africa, the Chief Veterinary Officer, Swaziland, and the Director of Veterinary Services, Transkei. Miss S J Rust is thanked for the technical assistance provided.

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TO THE EDITOR — AAN DIE REDAKSIE

SOME THOUGHTS ON THE PRESENTATION OF SCIENTIFIC PAPERS

Sir,

Please allow me to make a few suggestions regarding the use of audio-visual aids in the presentation of scientific papers. Our biennial congress in Grahamstown last year once again impressed me with the tremendous amount of veterinary information being generated in this country.

I was perturbed, however, by the fact that the high quality of the contents of many papers were overshadowed by the mediocrity of the mode of presentation. On the positive side there were papers that will be remembered for a long time, simply because the speaker had flair and imagination.

1. *Overhead projectors:* The prime objective of this instrument is to have the speaker facing the audience. The majority of people, however, turn their backs on the auditorium and address the screen.
2. *Graphs and tables:* (a) These transparencies should be easily readable. Therefore have more, with less information on each one.
   (b) They should present only salient features. Our congresses are usually attended by people with widely divergent interests. Minute detail can be avoided because people who are particularly interested will probably get in touch with the speaker at a later occasion. A further advantage of shorter presentations is that more material can be included in the same programme.
3. *Summaries:* Slides or acetates which list the main points can contribute to a presentation. They should, however, serve as a guide for the discussion, and should *not* be read off verbatim.
4. *Illustrations:* 35 mm colour slides can greatly facilitate the often difficult task of description. Once again, they should present a clear picture of what the scientist is trying to convey to his audience. They should not be included if they do not contribute to the presentation.
5. *Flip charts:* I have seen these used to great effect by some speakers. The charts should be carefully prepared prior to the presentation, taking into account points 2, 3 and 4 above. Do not use the flip chart as substitute for a blackboard, i.e. face the audience.

I apologise if I have simply stated the obvious.

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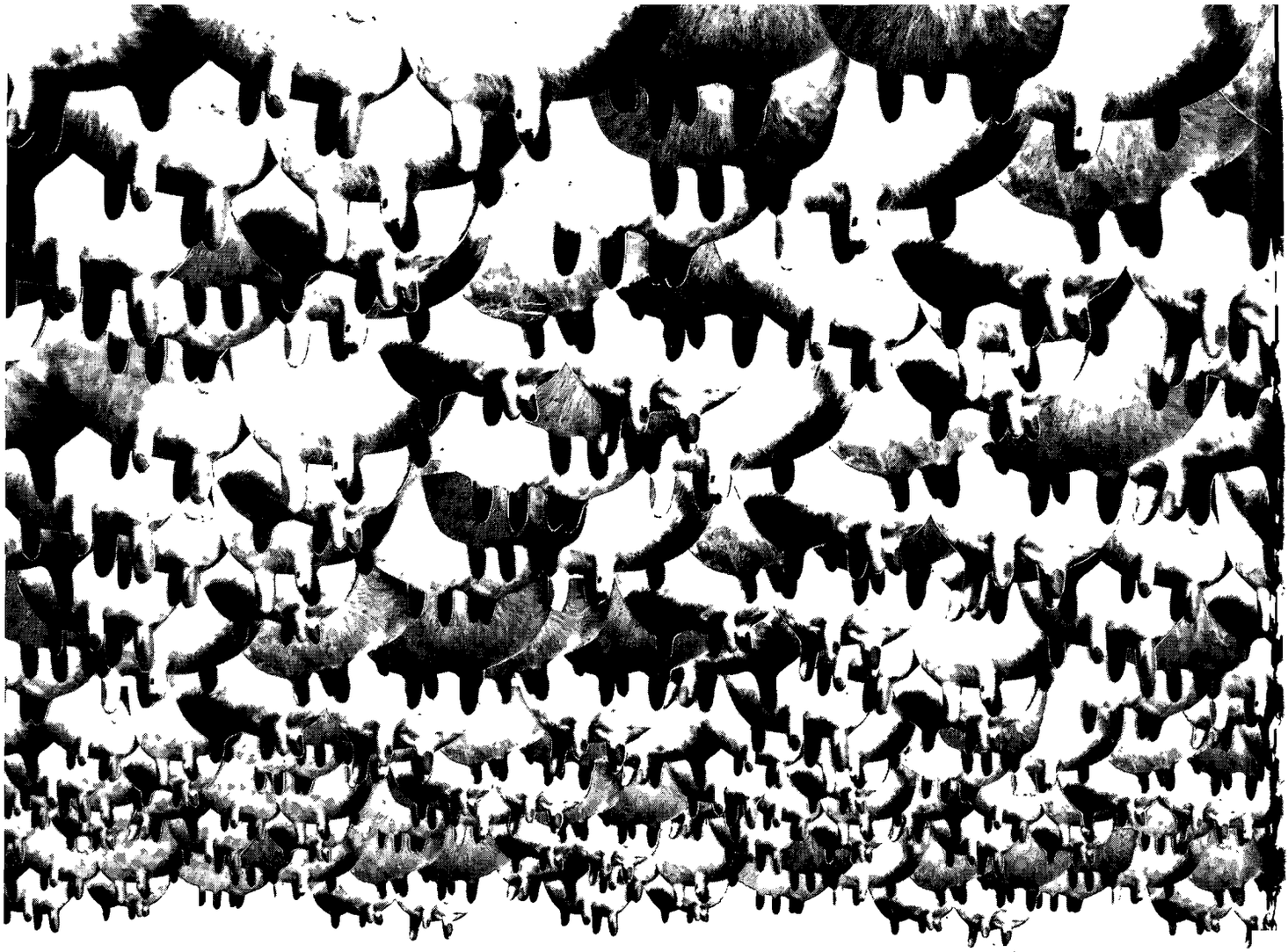
('It takes an unusual mind to appreciate the obvious' (Whitehead). When will those who present papers tumble to the simple truths outlined above? Similarly, when will authors learn to speak to their audiences? The moment a person lowers his eyes to the paper in front of him and starts to read:
(a) his voice drops to a mumbling, lifeless monotone;
(b) his audience falls asleep;
(c) the contents of his paper pass neither through his head, nor through the heads of his listeners;
(d) the whole presentation becomes an exercise in robot-like automation we can well do without. *Editor*).



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TICKS ASSOCIATED WITH KUDU IN THE EASTERN CAPE: PRELIMINARY REPORT

M. M. KNIGHT and Y. RECHAV

ABSTRACT: Knight M. M.; Rechav Y. **Ticks associated with kudu in the Eastern Cape: Preliminary report.** *Journal of the South African Veterinary Association.* (1978) **49** No. 4 343–344 (En) Tick Research Unit, Dept. Zoology and Entomology, Rhodes University, 6140 Grahamstown, Rep. of South Africa.

Ticks were collected from kudu *(Tragelaphus strepsiceros)* which were shot each month for a period of 13 consecutive months on two farms near the Great Fish River. *Amblyomma hebraeum* Koch, *Rhipicephalus appendiculatus* Neumann, *Rhipicephalus glabroscutatum* Du Toit and *Haemaphysalis silacea* Robinson, were the most commonly occurring species. The seasonal fluctuations of each developmental stage of these species are given.

INTRODUCTION

It is known that kudu *(Tragelaphus strepsiceros* Pallas), a commonly occurring antelope in the Eastern Cape, is a host of a number of tick species, some of which are of economic importance[1 3 4 6]. This study reports briefly the results of a survey conducted in an area where kudu are abundant, and is, to our knowledge, the first study of tick populations on kudu conducted over an entire year.

METHODS

Two kudu were shot each month, for 13 months (June 1976 to June 1977), on one of two farms (Bucklands and Ulster) in the Great Fish River Valley of the Eastern Cape. Ticks were removed from the kudu and then identified in the laboratory.

RESULTS AND DISCUSSION

The results are presented in the Table.

Four tick species were found commonly on kudu.

Rhipicephalus appendiculatus Neumann and *Haemaphysalis silacea* Robinson were the ticks most commonly recovered. Adults of *R. appendiculatus* were present on kudu from January to May (mid-summer to autumn) and those of *H. silacea* over the entire year, with a peak in November and December. Larvae of both species were present mainly in May and June, while nymphs were generally active during the cooler months with peaks in August (Table). The high numbers of *H. silacea* found on kudu support Norval's claims that this tick is common on river banks[5] as these antelope frequent this type of habitat.

Rhipicephalus glabroscutatum Du Toit is a rare tick, of which very little is known[2]. The adults of this species are present in high numbers on kudu from September to January (spring to mid-summer) with a peak in November. No larvae or nymphs were found on kudu. This indicates that the immature stages feed on other hosts, possibly small mammals, as does *Rhipicephalus simus* Koch or, even on birds, as is the case with *Hyalomma marginatum rufipes* Koch.

The total burdens of *Amblyomma hebraeum* Koch were greatest from November to May.

A few specimens of *R. simus, Rhipicephalus evertsi evertsi, Boophilus decoloratus* and *H.m. rufipes* were occasionally found on kudu during this survey.

ACKNOWLEDGEMENTS

We acknowledge the assistance of Dr. N. Fairall of the Department of Nature and Environmental Conservation, Cape Province, Dr. M.R. Perrin and Mr. T.S. Allen-Rowlandson of the Dept. of Zoology and Entomology, Rhodes University, and Messrs, A.L. Johnson and L.G. Walsh of Bucklands, Mr. D. Tucker of Ulster, Professor G.B. Whitehead, Director of the Tick Research Unit, Rhodes University, and Dr. R.A.I. Norval, Veterinary Research Laboratory, Rhodesia, who reviewed the manuscript.

Table: MEAN NUMBERS OF THE MORE COMMON LARVAE (L), NYMPHS (N) AND ADULT TICKS COLLECTED FROM KUDU IN THE EASTERN CAPE AT MONTHLY INTERVALS

Month	Mean numbers of ticks recovered															
	A. hebraeum				*R. appendiculatus*				*R. glabroscutatum*				*H. silacea*			
	♂	♀	N.	L.	♂	♀	N.	L.	♂	♂	N.	L.	♂	♀	N.	L.
June 1976	1	1	0	0	12	3	29	80	0	0	0	0	81	18	16	60
July	5	1	1	0	1	0	5	0	0	1	0	0	9	25	9	15
August	0	0	1	0	3	4	297	0	3	3	0	0	88	143	99	0
September	0	0	10	0	0	0	33	0	16	14	0	0	82	14	29	0
October	0	0	0	0	0	0	90	0	28	20	0	0	120	20	7	0
November	5	2	22	0	8	12	10	0	68	65	0	0	223	127	5	0
December	4	1	24	1	3	1	6	0	21	23	0	0	192	118	0	0
January* 1977	5	2	9	5	39	27	2	0	15	11	0	0	108	87	6	2
February	2	1	0	7	135	138	0	0	4	5	0	0	66	37	3	9
March	8	3	0	0	113	115	1	2	1	1	0	0	75	10	0	12
April	12	7	19	46	117	75	30	0	2	0	0	0	144	20	2	29
May	12	1	5	2	44	16	107	85	1	0	0	0	154	81	51	92
June	3	1	3	4	35	11	186	167	0	0	0	0	91	30	83	109

*Numbers from only one kudu.

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BOOK REVIEW — BOEKRESENSIE

THE SELECTION OF ESSENTIAL DRUGS

REPORT OF A WHO EXPERT COMMITTTEE

World Health Organization Technical Report Series*, 1977, No. 615 (ISBN 92 4 120615 2)
pp. 36. Price: Sw.fr. 5.

The publishers give the following information concerning this book:

"As much as 40% of the entire budget for health care of some developing countries may be spent on medicaments, the rising cost of which is causing increasing concern even in the more affluent countries. Many countries, also, are under pressure to increase the number of available drugs to include duplicate products marketed under different brand names as well as products of questionable efficacy.

"It is up to each country to decide what drugs are essential, according to its own health policies. To assist countries to identify their own priorities and make their own selection of essential drugs, the World Health Organization recently convened an Expert Committee, whose report includes a model list of about 200 active substances which are considered indispensable for the health care of a population and provides guidelines for the establishment of national lists in the light of national circumstances.

"The Expert Committee recommends that such lists should include only drugs that have been proved to be effective, to satisfy the needs of the population, and to have an acceptable degree of safety (in drawing up its model list the Committee deliberately excluded some very effective new drugs for lack of data on their long-term safety). In the case of therapeutically equivalent drugs, the cheapest effective product that is acceptable by the criteria given in the report should be chosen. One principle underlying the selection of drugs is that priority should be given to achieving the widest possible coverage of the population in order to provide for the prevention and treatment of the most prevalent diseases. The list that any country may draw up, therefore, may not provide for the needs of every person, but should do so for the needs of the great majority."

The emphasis is solely on drugs used in human medicine and only a limited selection has any practical application in veterinary medicine. It is just a list and very little else.

W.H.J.

*WHO publications in South Africa are handled by Van Schaik's Bookstore (Pty) Ltd., P.O. Box 724, 0001 Pretoria.

THE DIVIDED DOSAGE / LOW DOSAGE CONCEPT USING FENBENDAZOLE

J. -G. GAENSSLER*, C.A. WILKINS† and W.M. O'DONNOVAN‡

ABSTRACT: Gaenssler J.-G; Wilkins C.A.; O'Donnovan W.M. **The divided/low dosage concept using fenbendazole.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 345–349 (En) Hoechst Pharmaceuticals (Pty) Limited, P.O. Box 8692, 2000 Johannesburg, Rep. of South Africa.

Fenbendazole was administered as an anthelmintic to cattle and sheep by incorporation into feed blocks. The therapeutic dose of 5 mg/kg live mass for sheep and 10 mg/kg for cattle was administered in divided dosages over periods of 4 d and in some cases 5 d. The periods were limited to obviate possible development of resistance. The anthelmintic effect was equal to, or better than, the standard therapeutic dose administered as a single dose in the form of the commercially available fenbendazole suspensions, when comparing the results obtained by the modified non-parametric method of evaluating anthelmintics.

INTRODUCTION

From about 1940 phenothiazine was administered at a low level in mineral licks in an attempt to control internal parasites[7 8 10 11]. In South Africa, considerable work has been done on the use of phenothiazine in lick blocks and lick crumbles[2 16], and more recently with thiabendazole, an anthelmintic with a far broader spectrum, in a mineral supplement lick[14 15].

It has been found, also, that continual administration of fenbendazole at a dosage of 0,1 mg/kg/d caused sterilization of *Haemonchus contortus* eggs followed by expulsion of the worms within a few days. (Düwel – Personal communication). The favourable effect of divided therapeutic doses of fenbendazole was clearly shown to be due to continuous pressure of the anthelmintic on the worms over an extended period[12]. These results indicated that fenbendazole could probably be used successfully in a low level dosage regimen.

Recently, in association with Rumevite (National Chemical Products) this divided dosage concept has been put into practice by incorporating fenbendazole (Panacur: Hoechst) into separate feed block formulations for sheep and cattle.

On farms where phenothiazine medicated blocks were being used and stock had been accustomed to block intake, field trials were instituted with fenbendazole as well as phenothiazine. Egg counts were monitored in control, phenothiazine and fenbendazole treated groups of sheep. A daily dose of fenbendazole of 0,1 mg/kg live mass had resulted in adequate parasite control under favourable climatic conditions[5]. These trials indicated that there was merit in the idea of including a broad spectrum anthelmintic in a block or a feed at a much lower rate than normally used for therapeutic purposes. For practical purposes, 0,1 mg/kg live mass/d was too low. At this extremely low dose, especially when incorporated into a salt/bone meal formulation, factors such as heavy rains could reduce block intake to such an extent that the minimal daily dose of 0,1 mg/kg live mass would not be met and control could not be maintained[5].

A trial done in cattle at a daily intake of 0,2 mg/kg provided some extremely interesting results[3]. The four untreated controls had mean worm burdens of 1 610 *Ostertagia ostertagi* and 120 *Dictyocaulus viviparus*. No worms, however, were recovered from three groups of four cattle medicated for 60 d, 39 d and 23 d, commencing respectively 7 d before and 14 d after infestation (i.e. during the prepatent period), and 33 d after infestation (after the worms had reached patency).

All these results led to the development of a concept of low level dosing of sheep and cattle by means of feed blocks, with a minimum individual daily intake of fenbendazole of 0,2 mg/kg live mass/d. The widely differing stock farming methods followed in South Africa made feed blocks the most practical vehicle. Treatment was initially envisaged for specific times of the year, extending over reasonably prolonged periods of one or even two months, which would coincide with a special feed period, e.g. during winter, lambing or mating. Subsequently concern arose over the possibility of the development of resistance in helminth populations exposed to low levels of anthelmintic for fairly extensive periods, especially where the vehicle intake can vary considerably and particularly in view of the resistance of certain strains of *H. contortus* to the benzimidazole group of anthelmintics[1]. It was thus decided to include the anthelmintic in feed blocks at a split therapeutic dosage rate for a definite, limited period of time. The inclusion rate would be so devised that the total dose received within the time period corresponded to that of a single therapeutic dose of the anthelmintic for the animal species concerned, as indicated in the examples below.

The effective dose of fenbendazole for sheep is 5 mg/kg live mass, which, for a 50 kg animal, would be 250 mg. In terms of the divided dosage concept this could be supplied

1. by a single therapeutic dose administered orally;
2. by a single dose of 250 g of feed block consumed in one day and medicated with fenbendazole at 1 kg/t (i.e., 1 mg fenbendazole/g of feed block);
3. in divided doses in various permutations, using the same feed block formulation and aiming at a total therapeutic dose of 250 mg for a 50 kg animal supplied over a period of 2–7 d as shown in Table 1.

Table 1: CALCULATED DAILY INTAKE OF FENBENDAZOLE/VEHICLE FOR SHEEP

Period (d)	Fenbendazole mg/kg daily intake – mg	Feed block/lick (1 mg fenbendazole/g) daily intake – g
2	2,5	125
3	1,67	83,3
4	1,25	62,5
5	1,00	50,0
6	0,83	41,67
7	0,71	35,50

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‡P.O. Box 285, 2008 Bedfordview.

In the case of cattle the dose of fenbendazole is 10 mg/kg live mass; thus an animal of 300 kg live mass requires a therapeutic dose of 3 000 mg of active ingredient, which can be supplied as shown in Table 2.

Table 2: CALCULATED DAILY INTAKE OF FENBENDAZOLE/VEHICLE FOR CATTLE

Period (d)	Fenbendazole mg/kg daily intake – mg	Feed block/lick (1 mg fenbendazole/g) daily intake – g
1	10	3 000
2	5	1 500
3	3,33	1 000
4	2,5	750
5	2,0	600
6	1,67	500
7	1,42	428,6

EXPERIMENTAL WORK

Experimental animals and infestations

The sheep used in the experiments were cross-bred Merinos about six months of age. Animals were housed under cover on a cement floor. As a preliminary treatment they were given a double therapeutic dose of levamisole*, of parbendazole† and of fenbendazole‡ at 2 d intervals. These remedies were administered separately. Faecal worm egg counts were done daily for 28 d. The animals were fed on parasite-free hay and had free access to unmedicated feed blocks.

The cattle used in the experiments were young bullocks of mixed breed. The animals were introduced into the experimental pens and dosed on alternate days with double the therapeutic dose of levamisole, followed by parbendazole, and then by rafoxanide§. Faecal worm egg counts were done daily for 21 d before the calves were considered free from parasites.

The mass of each animal was determined before, during, and at the end of the trial period. The sheep were infested orally by dosing them with infective larvae of *Haemonchus contortus, Nematodirus spathiger, Oesophagostomum colubriformis* and *Ostertagia circumcinta.* Cattle were similarly infested with *Ostertagia ostertagi, Cooperia* spp. and *Oesophagostomum radiatum*.

The animals had free access to unmedicated feed blocks. Every week the mass of these blocks was determined and the mean daily consumption calculated.

Treatment

Blocks medicated with fenbendazole were introduced at times according to the developmental stages of the worm species concerned.

Helminth recovery

At slaughter the worms were recovered, identified and counted as described by Reinecke[13].

*Tramisol: I.C.I.
†Helmatac: Coopers
‡Panacur: Hoechst
§Ranide: M.S.D.

Experiment 1

Materials and methods

Seventy-two sheep were divided into 12 groups of six animals each. Six groups were infested with *N. spathiger, O. circumcincta* and *T. colubriformis,* and 6 groups were infested with *H. contortus* and *O. columbianum.* The lick given to treated groups was medicated with 320 g/t of fenbendazole. Six of the groups were treated for 4 d only, two groups received treatment for 14 d and two groups for 28 d.

Results

The results are summarised in Tables 3 and 4.

Experiment 2

Materials and methods

Fenbendazole was incorporated into a feed block at the rate of 500 g/t. This was tested against fourth stage *H. contortus,* third stage *O. columbianum,* third stage *T. colubriformis* and fourth stage *N. spathiger* in sheep. A total of 20 animals was used, divided into a treated group of 11 and a control group of 9 animals.

Treatment took place over a 4 d period, treated animals receiving a mean dose of 128,1 mg fenbendazole which was 5,4% lower than the mean 135,5 mg required when calculated at 5 mg/kg on the mean mass of 27,1 kg for the group.

Results

The results evaluated by the modified non-parametric method (NPM) for comparing worm burdens[6] are summarised in Table 5.

Experiment 3

Materials and methods

Fenbendazole was incorporated into a feed block at 1,22 kg/t. A trial was conducted in cattle against *O. ostertagi* (adult), *Cooperia* spp. (4th stage), and *O. radiatum* (3rd stage). Twenty animals were used, 11 in the treated group and 9 in the control group.

The treated group had access to the fenbendazole lick for a period of 5 d resulting in a mean dose of 3 769,8 mg fenbendazole, which was 7,7% higher than the mean dose of 3 500 mg fenbendazole required, when calculated at 10 mg/kg on the mean mass of 350 kg for the group.

Results

The results evaluated by the non-parametric method for comparing worm burdens[6] are summarised in Table 6.

Experiment 4

Materials and methods

Fenbendazole was incorporated into a feed block at 320 g/t. It was tested in sheep against adult worms of the benzimidazole-resistant Boshoff strain of *H. contortus.* In this experiment 18 animals were used, divided into two groups of 9 animals each. The treated group had access to lick for 4 d, resulting in a mean intake of

Table 3: EXPERIMENT 1. EXPERIMENTAL DESIGN AND WORM RECOVERY AT NECROPSY

Group No.	Stage of development at treatment	Duration of treatment (d)	Mean daily intake of fenbendazole (mg)	*N. spathiger*		*O. circumcincta*		*T. colubriformis*	
				Larvae dosed*	Worms recovered†	Larvae dosed	Worms covered	Larvae dosed	Worms recovered
1	3rd	4	53,36	3 000	0	3 000	1	3 000	1
2	4th	4	50,28	3 000	1	2 000	0	2 800	0
3	Adult	4	48,42	2 870	0	3 000	1	2 970	0
4	Adult	14	42,59	3 000	0	3 000	0	3 000	0
5	Adult	28	52,07	3 000	0	3 000	0	3 000	0
6	Control	—	—	3 000	7 392	3 000	8 464	3 000	7 306

* "Larvae Dosed" indicates the mean larval dose given to each animal in the experimental group.
† "Worms recovered" denotes the total number of worms recovered per group of six animals.

Table 4: EXPERIMENT 1. EXPERIMENTAL DESIGN AND WORM RECOVERY AT NECROPSY

Group No.	Stage of development at treatment	Duration of treatment (d)	Mean daily intake of fenbendazole (mg)	*H. contortus*		*O. columbianum*	
				Larvae dosed*	Worms recovered†	Larvae dosed	Worms recovered
1	3rd	4	43,01	3 000	6	720	16
2	4th	4	44,06	2 970	0	750	0
3	Adult	4	41,10	3 000	0	800	0
4	Adult	14	54,82	3 000	6	800	1
5	Adult	28	42,07	3 000	4	800	3
6	Control	—	—	3 000	11 276	5 720	3 114

* "Larvae Dosed" indicates the mean larval dose given to each animal in the experimental group.
† "Worms recovered" denotes the total number of worms recovered per group of six animals.

Table 5: EXPERIMENT 2. WORMS RECOVERED, IDENTIFICATION OF SPECIES, PERCENTAGE REDUCTION AND EFFICACY CLASSIFICATION

Sheep No.	Worms recovered				
	H. contortus	*O. columbianum*	*T. colubriformis*	*N. spathiger*	Total (all species)
Treated Sheep					
1	2	3	0	0	5
2	0	0	0	0	0
3	4	0	0	1	5
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
Mean	0,5	0,3	0	0,1	0,9
Untreated Control Sheep					
12	915	110	692	539	2 256
13	878	241	1 273	597	2 689
14	900	184	280	1 471	2 835
15	1 121	131	1 170	130	1 542
16	1 847	205	720	441	3 213
17	668	234	1 647	749	3 298
18	1 122	341	655	477	2 595
19	1 127	286	279	1 124	2 966
20	1 285	295	526	1 007	3 113
Mean	1 112	225	804	692	2 834
% Reduction	99,9	99,9	100	99,9	99,9
Classification	A	A	A	A	A

Table 6: EXPERIMENT 3 – WORMS RECOVERED, IDENTIFICATION OF SPECIES, PERCENTAGE REDUCTION AND EFFICACY CLASSIFICATION

	Worms Recovered		
Animal No.	*O. ostertagi*	*Cooperia* spp.	*O. radiatum*
	Treated Cattle		
1	1	0	2
2	0	0	0
3	2	11	1
4	0	2	0
5	0	0	0
6	20	10	0
7	0	4	4
8	0	0	0
9	0	1	0
10	4	0	5
11	1	0	2
Mean	2,5	2,6	1,3
	Untreated Control Cattle		
12	136	4 036	164
13	2 356	4 361	300
14	1 599	436	140
15	1 128	610	114
16	2 084	982	160
17	3 015	1 079	87
18	3 690	3 543	244
19	624	3 116	164
Mean	1 829	2 270	172
% Reduction	99,9	99,9	99,3
Classification	A	A	A

Table 7: EXPERIMENT 4 – THE NUMBER OF *H. CONTORTUS* RECOVERED AND THE PERCENTAGE REDUCTION IN WORM BURDEN

Animal Number	Number of *Haemonchus contortus* recovered
	Treated Sheep
1	0
2	1
3	1
4	0
5	0
6	0
7	0
8	7
9	21
Mean	3,3
	Untreated Control Sheep
10	1 154
11	102
12	154
13	1 188
14	1 568
15	2 315
16	2 699
17	1 141
18	1 282
Mean	1 289
% Reduction	99,7

66,4 mg fenbendazole, which was 0,6% higher than the mean dose of 66 mg required, when calculated on a mean mass of 13,2 kg for the group.

Results

The results are summarised in Table 7.

DISCUSSION

The mechanism of action of a divided therapeutic dose of fenbendazole has been shown to be due to continuous pressure of the anthelmintic on the worms for a long period[12].

The route of administration may play an important role in the efficacy of an anthelmintic[9]. Work done in Australia on sheep infested with both thiabendazole-resistant and susceptible strains of *Haemonchus* and *Trichostrongylus* demonstrated that there is a significant difference in response to the route of administration. Susceptible species will respond whether the anthelmintic is given intraruminally or intraabomasally. Resistant species, however, respond far better to treatment with the drug given into the rumen than they do when the drug is delivered directly into the abomasum. These results apparently apply only to fenbendazole. Of the other benzimidazoles tested, the only one which showed a similar response was parbendazole, in which case the resistant *Trichostrongylus* responded better to intraruminal treatment than to treatment with the drug placed directly into the abomasum[9].

The use of a divided therapeutic dose administered in a feed block has a great advantage in that treatment can be extended over a longer period without increasing the cost of treatment. It also enables full advantage to be taken of one of the outstanding features of the benzimidazole group of anthelmintics, namely its ovacidal activity[4]. By making full use of the combined ovacidal activity and the broad spectrum efficacy, one can expect to attain a truly prophylactic approach to worm control. In this respect it is particularly important to note also the efficacy of a divided dose against the resistant strain of *H. contortus*. Furthermore, the method has the advantage that it can be combined easily with supplemental feeding during critical periods; this obviates the labour-intensive, time-consuming method of handling each individual animal, as is the case when conventional treatment is given.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the invaluable assistance given them by Drs P. Bradfield, J. van Wyk, I. Horak, W. Sykes, Mr J. van Heerden and the laboratory staff of the Hoechst Research Institute at Malelane.

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BOOK REVIEW — BOEKRESENSIE

HEALTH IMPLICATIONS OF NUCLEAR POWER PRODUCTION

WHO Regional Publications – European Series No. 3. World Health Organisation – Regional Office for Europe, Copenhagen
pp. III, 75, Fig. 4, Tabs 12, Pubi. Price Swfr 8.00.

This is a report of the working group which met in December 1975 in Brussels to study, discuss and appraise the effects of nuclear power industry on man and the environment. The group was formed by the Regional Office for Europe to deal with the concern of the general public about the safety of nuclear power generation. The report is based upon the collective knowledge and experience of the members of the Working Group as well as on the available literature. It provides some guidelines for public health authorities.

The Working Group reviewed the experience gained from building and operating nuclear facilities and made estimates of the attendant health risks. In doing so they also considered estimates of the risk associated with the generation of electrical power from other types of fuel. Attention was focussed on (a) the radiation risks to man, both somatic and genetic, and the environmental aspects of the nuclear fuel cycle from mining to disposal of radioactive waste products; (b) the likelihood and consequences of nuclear and non-nuclear accidents, sabotage and theft of nuclear material. Details of conclusions and recommendations are furnished in the report.

In the body of the text the interested reader will find a great deal of valuable categorised information. The degree of risk related to nuclear power plants is reflected in a statistical exposition of risks of acute death from various causes. This ranges from a high risk of 1:4 000 for motor vehicles through 1:2 000 000 for lightning to the lowest of 1:5 000 000 (estimated) in 100 nuclear reactor plants in the U.S.A. Veterinarians will be interested in the chapters dealing with the health effects of radiation and a consideration of health effects from nuclear and alternative energy production systems.

L.W. v.d. H.

Die mees belangrike 21 dae in 'n koei se jaar.

Die Probleem.

'n Hoë persentasie koeie het 'n residuele infeksie aan die einde van laktasie.

Daarby is alle koeie vatbaar vir 'n nuwe infeksie gedurende die vroeë stadia van die droë periode. Met 'n paar uitsonderings sal dit gedurende die eerste 10 tot 21 dae voorkom.

Die Antwoord.

Orbenin Droë Koei is ontwerp om beide hierdie probleme te oorbrug Dit is geformuleer as gevolg van aanhoudende navorsing, beide in die laboratorium en in die veld.*

Orbenin Droë Koei is bakteriedodend teen streptokokke, penisillien sensitiewe en penisillien weerstandbiedende staphylokokke, die mees oorsaaklike organismes wat in residuele en nuwe infeksies gevind word.

Dit was duidelik uitgewys dat infeksie tydens kalwing gewoonlik van NUWE oorsprong en meesal 'n omgewings, of Gram -we infeksie is. Behandeling tydens daardie tyd met 'n breëspektrum Lakterende Koei produk soos Ampiclox L.K. is nodig om genoegsame antibiotiese konsentrasies te bereik om mastitis tydens kalwing te voorkom.

Orbenin Lakterende Koei en Ampiclox L.K. is bedoel om mastitis gedurende laktasie te beheer. Ampiclox word veral aanbeveel wanneer coliforme vermoed word.

Orbenin (kloksasillien) en Ampiclox (ampisillien/kloksasillien) is Beecham handelsmerke.

*Die jongste kliniese proef het 507 kuddes oor 'n tydperk van 3 jaar ingesluit – Brander G.C., Watkins J.H., en Gard R.P., Vet Rec. (1975) 97. 300-304.

Beecham Dieregesondheid **Vordering in die Praktyk**

Afdeling van Beecham Pharmaceuticals (Edms) Bpk., Posbus 347, Bergvlei, 2012.

BA 4138

CASE REPORT **GEVALVERSLAG**

A CHRONIC WASTING SYNDROME IN A HORSE ASSOCIATED WITH GRANULOMATOUS ENTERITIS

R.C. BESTER* and J.A.W. COETZER†

ABSTRACT: Bester R.C.; Coetzer J.A.W. **A chronic wasting syndrome in a horse associated with granulomatous enteritis.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 351–353 (En) 115 Jan Hofmeyr Road, 3630 Westville and Section of Pathology, Vet. Res. Inst., 0110 Onderstepoort, Rep. of South Africa.

A case of granulomatous enteritis in a 2 year-old Thoroughbred colt is reported. Clinically the horse showed chronic wasting and subcutaneous oedema of the ventral parts of the body and legs. Grossly the wall of the jejunum and ileum was uniformly thickened. Microscopically the lamina propria, submucosa and the tunica muscalaris of the small intestine were infiltrated with 'ymphocytes, plasma cells, epithelioid cells and occasional multinucleated giant cells. The granulomatous reaction was most marked in the muscular layers of the gut wall.

INTRODUCTION

Equine granulomatous enteritis is a disease characterized mainly by chronic wasting and is sometimes also associated with a persistent diarrhoea[3]. Cimprich[2] pointed out the remarkable resemblance of this disease to Crohn's disease, which is a granulomatous enteritis of unknown aetiology in humans where the lesions, both macroscopically and microscopically, resemble those found in equine granulomatous enteritis. She also stated that the lesions corresponded to those seen in tuberculosis in the horse. Apart from granulomatous enteritis, alimentary lymphosarcoma[5] in the horse has also been associated with chronic wasting due to malabsorption.

This case is reported because of the rare occurrence of this syndrome. As far as could be ascertained, this is the first reported case of equine granulomatous enteritis in the Republic of South Africa.

CLINICAL FINDINGS

Veterinary attention was called for when a 2 year-old Thoroughbred colt was found to be listless in his stable, before being sent out to train. Previous to this he had been regarded as healthy and normal by his trainer.

On initial examination he was depressed, slightly anaemic and had a rectal temperature of 38,5°C.

During the following two weeks the colt became progressively emaciated. His temperature was monitored twice daily and was always slightly elevated with intermittent peaks (39,4°C was the highest recorded). The listlessness and depression became progressively worse. After a few days the colt developed a grade II systolic heart murmur audible on the left and right sides of the thorax. A mild subcutaneous pitting oedema developed which mainly affected the hind legs, ventral midline and the scrotum. The mucous membranes appeared anaemic. His appetite was normal until the day prior to euthanasia, 13 d after presentation, when he refused to eat. The faeces were regarded as normal throughout the course of the illness.

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TREATMENT

This consisted of a course of corticosteroids for a week, as well as general symptomatic treatment, but the colt showed no response.

LABORATORY FINDINGS

Complete haematologic examinations and plasma protein electrophoretic patterns were performed at various intervals during the course of the illness. The initial blood count revealed an anaemia, lymphopenia and a neutropenia. Hypoalbuminaemia was a pertinent finding. Subsequent blood counts revealed a progressive anaemia and a further drop in leukocytes. The albumin fraction of the total proteins remained low. These results are given in the Table.

Faeces examination revealed a severe strongyle infestation.

Table: CLINICAL LABORATORY FINDINGS THROUGHOUT THE COURSE OF THE ILLNESS

Day	1	6	7	9	11	13
Packed cell volumne (%)	25	21	22	22	18	18
Red cell count (10^6/mm^3)	6,51	6,06	5,71	4,83	4,25	4,13
White cell count (/mm^3)	4 200	4 000	3 700	3 700	3 900	2 800
Neutrophils (%)	24	25	26	41	43	34
Lymphocytes (%)	59	69	72	55	54	65
Monocytes (%)	4	6	2	3	2	1
Eosinophils (%)	3	—	—	1	1	—
Basophils (%)	–	—	—	—	—	—
Total plasma protein (g/100 mℓ)	ND	6,4	ND	6,0	6,9	ND
Albumin (g/100 mℓ)	ND	1,7	ND	1,9	2,1	ND
Globulin (g/100 mℓ)	ND	4,7	ND	4,1	4,8	ND

ND = Not done

At autopsy the carcass appeared emaciated and anaemic. A subcutaneous oedema was noticed in the ventral midline, hind legs and scrotum. The peritoneal cavity contained a moderate amount of a yellow fluid.

Apart from the small intestine and its regional lymph nodes, all the other organs appeared macroscopically normal. The most obvious lesions occurred in the wall

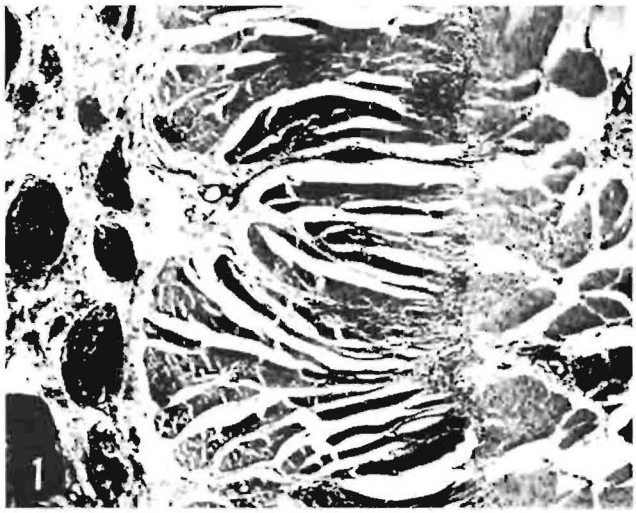

Fig. 1. Focal areas of mononuclear cell infiltration and fibroplasia in the tunica muscularis of the duodenum. H.E. *x* 75.

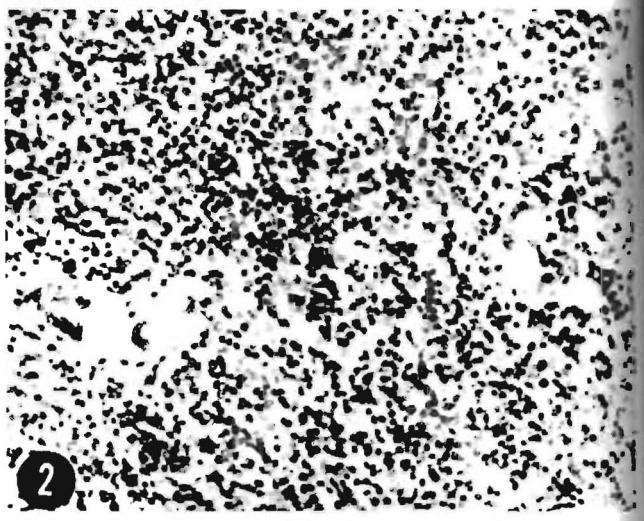

Fig. 2. Prominent granulomatous reaction containing some giant cells in the wall of the jejunum. H.E. *x* 200.

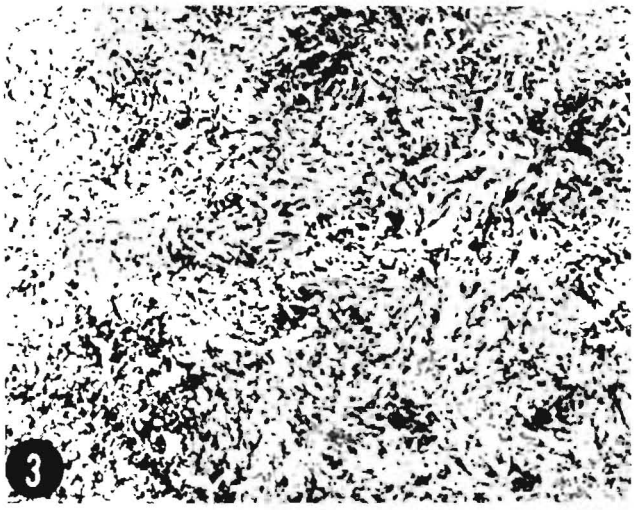

Fig. 3. Epithelioid cells and fibroblasts obliterating the tunica muscularis of the gut wall. H.E. *x* 200.

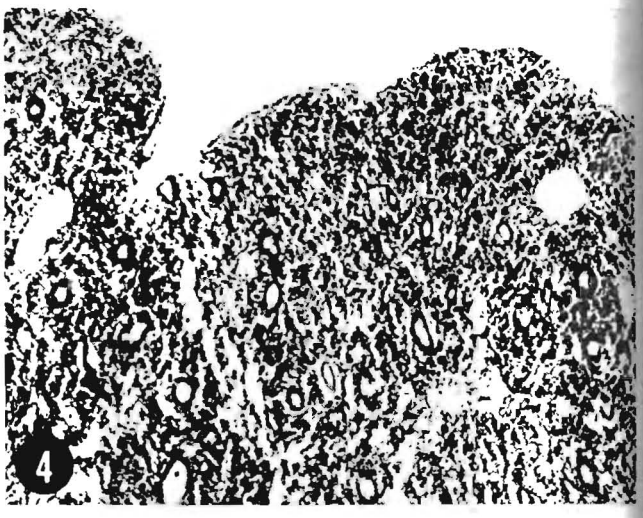

Fig. 4. Marked villus atrophy and severe mononuclear cell infiltration in the lamina propria of the intestine. H.E. *x* 200.

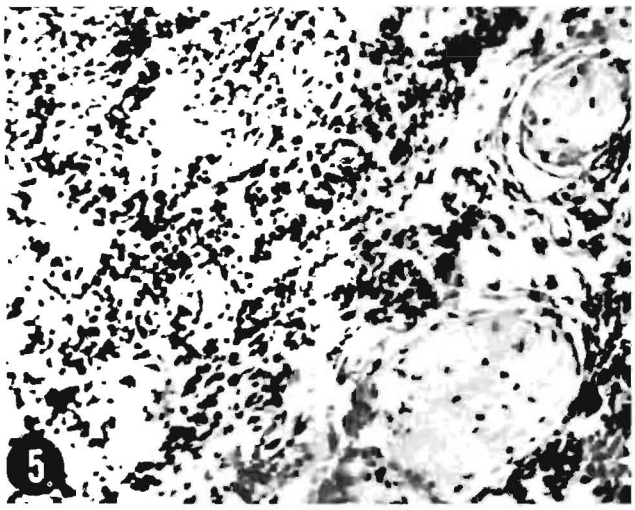

Fig. 5. Thrombosis of the smaller blood vessels in the submucosa of the gut. H.E. *x* 200.

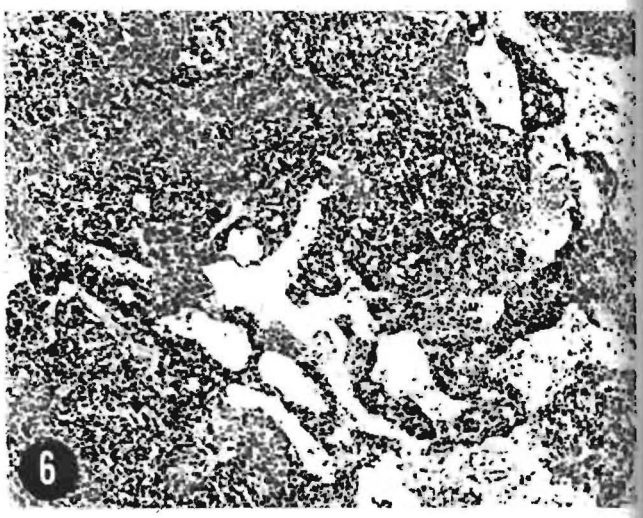

Fig. 6. Dilatations of the sinuses in the lymph node owing to severe oedema. H.E. *x* 200.

of the jejunum and ileum which was uniformly thickened and firm. No adhesions were seen between the intestinal loops and the serosal surface was not affected. The intestinal mucosa had a thickened, pale and corrugated appearance, with a few superficial congested patches,about 10 mm in diameter; no erosions were present.

The mesenteric lymph nodes were enlarged, varying in size from 30 to 70 mm in diameter. The cut surfaces were moist and had a homogeneous pale colour. Specimens for histopathological examination were taken from the majority of organs. Sections were stained with haematoxylin and eosin (HE). In addition several of those from the small intestine were stained with the periodic acid-Schiff reaction (PAS)[4] and Gomori's methenamine silver nitrate (GMS)[1] for fungi and with the Gram and Ziehl-Neelsen (ZN)[1] methods for bacteria. Schmorl's technique[1] for lipofuscin and Perl's reaction[1] for ferric iron were applied to some liver and kidney sections.

MICROSCOPIC FINDINGS

Small Intestine

All parts of the small intestine were affected but the most severe lesions occurred in the jejunum and ileum.

A marked diffuse, mononuclear cell infiltration (especially lymphocytes and some macrophages and plasma cells) was seen in the lamina propria and submucosa throughout the whole length of the small intestine and even between Brunner's glands. Occasional multinucleated giant cells and eosinophils were noticed between these infiltrating cells.

Focal areas of mononuclear cell infiltration and fibroplasia occurred in the tunica muscularis of the duodenum, mainly between the circular and longitudinal muscle layers (Fig. 1). In the jejunum and ileum a prominent diffuse granulomatous reaction, containing some giant cells (Fig. 2), many epithelioid cells and fibroblasts, practically obliterated the tunica muscularis (Fig. 3). This granulomatous reaction resulted in a gross thickening of the gut wall. Villus atrophy was marked (Fig. 4), in addition the mucosal epithelium was cuboidal to flat in some areas. Vasculitis, frequently accompanied by thrombosis (Fig. 5) of the smaller blood vessels in the submucosa, was seen in some of the sections. No bacteria or fungi could be demonstrated with the special stains applied.

Spleen

No indications of neoplasia or lymphoid proliferation were evident in the spleen; on the contrary, lymphoid atrophy was a prominent feature. The malpighian bodies were small and inactive, and the red pulp had a washed-out appearance.

Lungs

In the lungs a slight peribronchiolar and peribronchial fibrosis was observed. Macrophages in the alveolar septae contained haemosiderin and scattered eosinophils were seen throughout the lung tissue.

Kidneys

Except for cloudy swelling, hydropic degeneration and pigmentation of the proximal convoluted tubules, no other lesions were seen in the kidneys. Some of these pigments stained positive with Schmorl's technique for lipofuscin and others gave a positive reaction with Perl's reaction for ferric iron.

Liver

Scattered single foci of necrosis with cell infiltration were noticed in the parenchyma and the portal triads were moderately infiltrated with mononuclear cells. The Kupffer cells contained a moderate amount of lipofuscin and haemosiderin pigments.

Lymph nodes

No evidence of lymphoid proliferation could be found in the mesenteric lymph nodes. Nevertheless, reticuloendothelial cell proliferation was prominent and the sinuses were markedly dilated (Fig. 6) owing to severe oedema. Apart from a moderate lymphoid atrophy, no other lesions were seen in the peripheral lymph nodes.

DISCUSSION

The diagnosis of granulomatous enteritis was based on the clinical signs, clinical pathology and the gross and histopathological lesions observed in the small intestine.

Very little is known about the syndrome in horses and the cause is as yet unknown. Merritt, Cimprich & Beech[3] reported on the clinical manifestations in 9 horses and stated that emaciation, hypoalbuminaemia and a decreased phagocytic activity of the mesothelial cells in the peritoneal fluid were constant findings. Cimprich[2] studied the pathology of these cases. According to her, all parts of the small intestine as well as the large intestine could be affected but the most marked changes were seen in the ileum and jejunum. In only one instance was *Mycobacterium tuberculosis,* avian type, isolated from the faeces[2] and acid fast bacteria were also demonstrated in sections of the gut and mesenteric lymph nodes of this case.

In the case reported here the gross and histopathological findings corresponded with those of Cimprich[2], the most severe lesions being in the jejunum and ileum. Although no microbiological examinations were done, no bacteria or fungi could be demonstrated microscopically.

ACKNOWLEDGEMENTS

The authors express their appreciation to Mr A.M. du Bruyn for the photography and Mr J.L. de B. van der Merwe and technicians of the Section of Pathology, Veterinary Research Institute, Onderstepoort for the preparation of the histopathological sections.

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CASE REPORT **GEVALVERSLAG**

PERSISTENT RIGHT AORTIC ARCH IN A HORSE

S.W. PETRICK, C.J. ROOS and J. VAN NIEKERK

ABSTRACT: Petrick S.W.; Roos C.J.; van Niekerk J. **Persistent right aortic arch in a horse.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 355–358 (En) Dept. Surgery, Faculty Veterinary Science, University of Pretoria, Box 12580, 0110 Onderstepoort, Rep. South Africa.

Persistence of the right fourth aortic arch was diagnosed in a Lipizzaner foal. All the procedures and findings concerning the examinations, the operation and the autopsy are described.

INTRODUCTION

Although persistent right aortic arch is a well-described phenomenon in the dog and ox, little can be found in the literature concerning its occurrence in the horse[1] and other domestic mammals. In June 1976 a seven months old male cat was successfully operated on in this department (Petrick, unpublished observations).

Persistence of the right fourth aortic arch results in constriction of the oesophagus by the *ligamentum arteriosum* situated dorsally and linking the pulmonary artery to the aorta. Subsequently the precardial and cervical oesophagus becomes dilated.

In this paper the anomaly in a foal is described in detail.

CASE HISTORY

A six months old Lipizzaner foal was referred to this Department with the history of regurgitating milk, since birth, from its mouth and nostrils whilst nursing. The same happened with the intake of solid food. The owner had found a normal palate on examination.

CLINICAL EXAMINATION

On arrival the dilated and well-filled cervical oesophagus was immediately noticed. The contents could be palpated easily (Fig. 1). A bilateral, greenish, mucoid nasal discharge was present. Auscultation of the lungs revealed no abnormal sounds although they were expected. The heart sounds were clearly defined and the animal appeared to be alert, lively and in a fair condition.

TRACHEO- AND OESOPHAGOSCOPY

The foal did not allow either tracheo- or oesophagoscopy procedures while standing and had to be cast. After passing the fibrescope through the nostril certain structures were examined with the following findings:

Normal palate
Distorted larynx
Oval shaped trachea in the region of the heart.

The scope could not be passed through the accumulated food in the cervical oesophagus.

Food was withheld for some hours and a radiological examination performed.

Fig. 1 Lipizzaner foal with the oesophagus well filled in cervical region.

RADIOLOGICAL EXAMINATION

A lateral standing survey radiograph of the cranial part of the thorax was taken using 40 mAs at 100 kV, a focus to film distance of 1100 mm fast intensifying screens and an 8:1 focussed grid.

Examination of the radiograph revealed a somewhat irregular but well-defined area of increased density in the dorsocranial part of the thorax partially overlapping the cranial edge of the aortic arch. A gradually tapering partial occlusion of the tracheal lumen, characteristic of extramural pressure, was associated with the above density and extended cranially from a point halfway between the aortic arch and the tracheal bifurcation (Fig. 2).

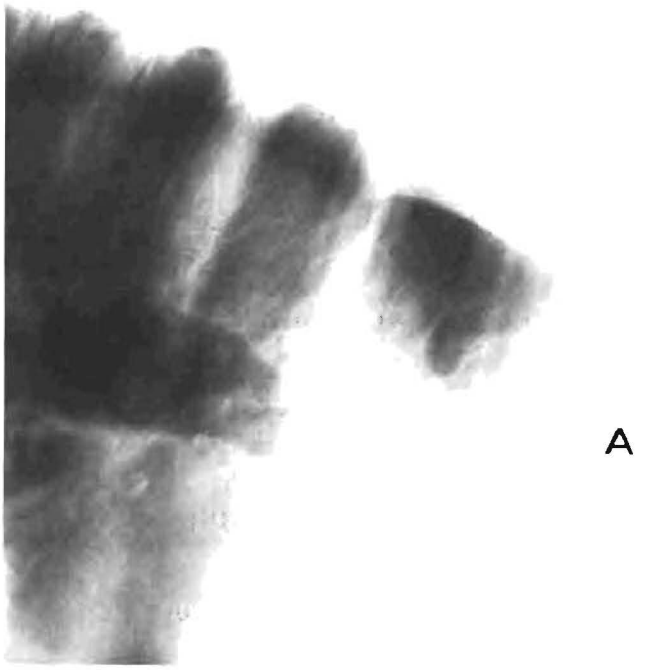

Fig. 2. Radiograph showing dilated, food-filled oesophagus in the cranial part of the thorax, as a rounded area of increased density (A).

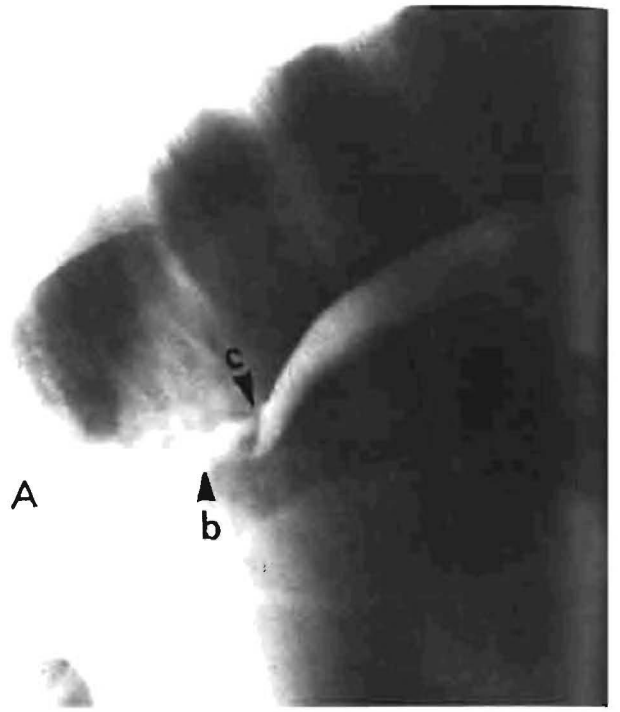

Fig. 3. Radiograph showing dilated oesophagus filled with bariu sulphate (A) and constricted by a broad fibrous brand (b), well as by the *ligamentum arteriosum* (c).

A stomach tube was passed into the oesophagus as far as it would go and approximately 100 ml of barium sulphate administered by gravitation. Massage over the distended lower cervical region was carried out to aid distribution of the contrast medium.

A second lateral standing radiograph was then taken using 64 mAs. A fairly marked and tortuous dilation of the oesophageal lumen was demonstrated to be the cause of the increased density shown on the survey radiograph (Fig. 3). The dilated lumen, represented by the barium column, tapered very abruptly caudally to be continued by an obviously constricted, slightly irregularly outlined segment about 40 mm long. The constricted segment was located over the middle three-fifths of the aortic arch shadow and terminated caudally by a narrow cord-like filling defect of the barium column, which stretched obliquely across it in a dorso-caudal direction (Fig. 3). This cord-like defect was assumed to be caused by a *ligamentum arteriosum* associated with a persistent right aortic arch, but the constriction of the segment cranial to it could not be explained pre-operatively.

As is the case in canines suffering from the same affliction, some barium-filled dilation of the lumen and tortuosity of the oesophagus indicated abnormality caudal to the obstruction. This was assumed to be the manifestation of a secondary and partial derangement of the nerve supply to the oesophagus.

The tentative diagnosis of persistent right aortic arch was confirmed and it was decided to attempt an operation. The foal was stabled with his mother for five d and it seemed to be doing fine with a normal body temperature recorded each day. For three d prior to the operation the animal received daily injections of antibiotics to counteract any lung pathology, which one could expect despite the clinically negative findings.

ANAESTHESIA

The patient with a persistent right aortic arch can b classed as an anaesthetic risk when presented for sur gery. Although the foal was in a reasonable condition there are protein and electrolyte deficits that have to b stabilized before any major surgery such as thoraco tomy can be attempted. Four d prior to, and on the da preceding the operation, fluid therapy in the form of 4 Ringer's lactate (Baxter) plus 500 mℓ Protiplex (Burns was given on both days.

During the operation 5ℓ of plasmalyte B (Baxter was given. The animal was allowed to breathe oxyger for 3 min prior to induction of anaesthesia with 10% halothane (Fluothane, ICI) and the cuffed endotra cheal tube (25 x 35 Rusch) could be inserted after 4 min. The respiratory rate at this stage was 6/min. The endotracheal tube was connected to a closed circuit system with maintenance of anaesthesia on 2% halothane During positive pressure ventilation applied for approximately 48 min pure oxygen alone was used.

The animal was hyperventilated for 6 min prior to the thoracotomy and positive pressure ventilation was maintained at 5 breaths/min. All visible lung tissue was normal, despite the chronic pneumonia that was present in the ventral parts of the apical lobe.

The anaesthesia was uneventful; the animal started breathing spontaneously just before closure of the chest.

OPERATION

The left side of the thorax was shaved and prepared for surgery. Owing to the age of the animal, the thorax was entered by means of an incision through the 4th intercostal space instead of by means of a rib resection. A

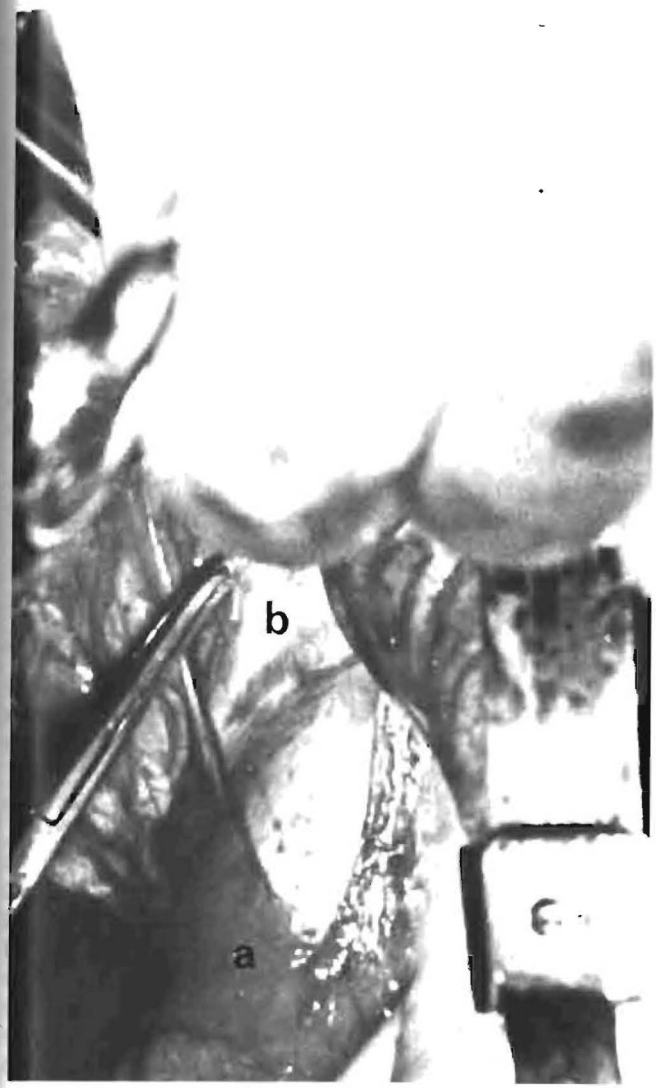

Fig. 4. Opened chest cavity showing the cardial pleura (a) and the fibrous pericardium (b).

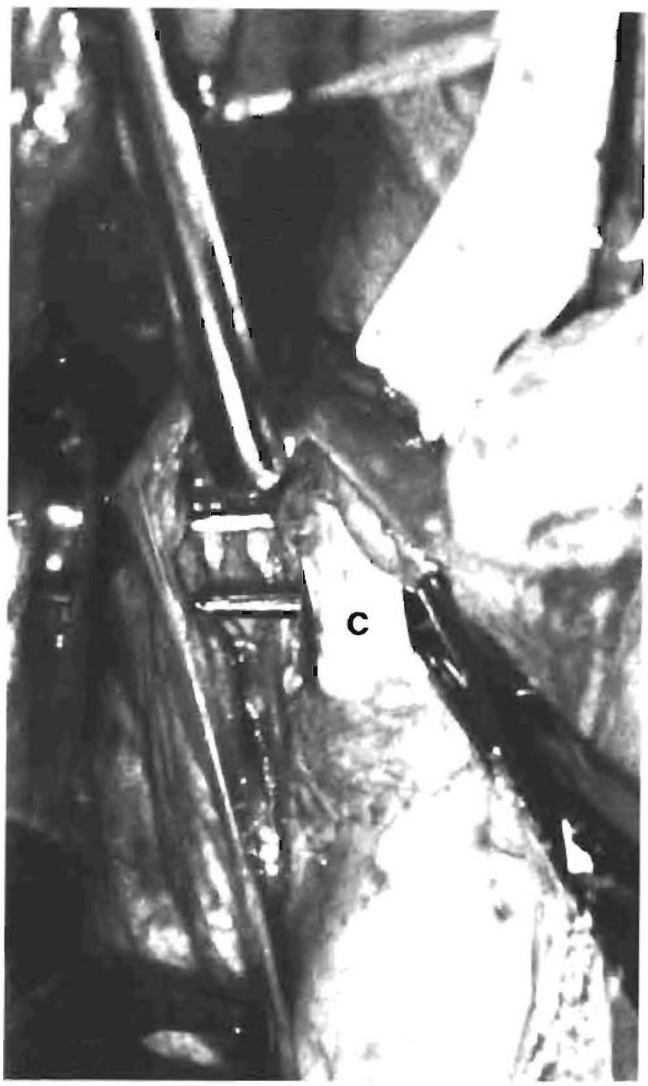

Fig. 5. The *ligamentum arteriosum* (C) lifted by a pair of forceps.

Finochietto rib spreader provided just enough space to complete the operation.

The visible lobes of the left lung seemed macroscopically to be normal and well expanded with the positive pressure inhalation. The lung was moved caudally, the pericardiac and mediastinal pleura was incised just cranial to the left tracheobronchial lymph nodes, which were lifted and moved caudally. The left recurrent nerve was identified and lifted with a Penrose drain while the left phrenic nerve was clearly visible but out of the way.

In the now nearly empty oesophagus a foal stomach tube was passed right up to the first obstruction, which was the strong fibrous layer of the pericardium (Fig. 4). The stomach tube was guided under this layer until it stopped against the *ligamentum arteriosum* which was not yet visible. The fibrous layer was incised and the thick white *ligamentum arteriosum* underneath it identified. Again the stomach tube was guided and forced under the *ligamentum arteriosum* for some distance into the postcardial oesophagus. A pair of dissecting forceps was used to lift the ligament (Fig. 5).

In the act of dividing the *ligamentum arteriosum* halfway between the aorta and pulmonary artery, a squirt of blood indicated that the *ligamentum arteriosum* was still patent on the aortic side. It was then clamped with two artery forceps, ligated and further divided. The ligament was patent for more than half its length on the aortic side but closed off on the side of the pulmonary artery.

The oesophagus was carefully freed from the surrounding tissues but movement of the stomach tube remained difficult, indicating that the non-functional postcardial oesophagus had a very small lumen. There were no further perioesophageal constricting tissues.

Before closure of the thoracic incision, the foal started breathing normally on its own and no cyanosis was present. Before the last sutures were placed however, the patient developed great difficulty with respiration and became cyanotic. It was moved to the recovery stable, still intubated and maintained on oxygen. Five hundred mg Cortensor (Wander) was given to support the failing heart but the patient died 45 min later.

AUTOPSY FINDINGS

A chronic focal pneumonia with a superimposed severe acute purulent pneumonia, both the result of aspiration of regurgitated food matter, were diagnosed. Death had been caused by asphyxiation.

DISCUSSION

It seems probable that this specific vascular anomaly can develop in any of the domestic species. This case revealed some interesting facts. Not only the oesophagus but also the trachea was constricted by the *ligamentum arteriosum* which, together with the fibrous pericardium, was responsible for the constriction. Primary closure of the patent *ductus arteriosus* had taken place at its junction with the pulmonary artery. The postcardial oesophagus had been unable to dilate for obvious reasons. Thus, in longstanding cases the bisection of the *ligamentum arteriosum* and the pericardium might not solve the problem completely. Rib resection is not necessary when dealing with this anomaly in the young animal.

In cases such as these, lung pathology as a result of aspiration of regurgitated food matter is to be expected. It was borne out by the finding of a chronic focal pneumonia at autopsy, despite the normal clinical picture presented. It was surprising that such a severe, acute purulent pneumonia could have existed, superimposed on the chronic condition, without being detectable before or during the operation, and without apparently being influenced to any major degree by the pre-operative antibiotic therapy.

CONCLUSION

Although the attempt in this foal had failed, the indications are that an early diagnosis and operation to correct the embryological defect might well have saved the life of a valuable animal.

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BOOK REVIEW — BOEKRESENSIE

AIDS TO NURSING SMALL ANIMALS AND BIRDS

J.S. HEATH (EDITOR), 2ND ED.
Baillière Tindall, London 1978
pp. 198, Figs 7, Numerous tables, Publ. price R7.40

This small, soft-cover book contains contributions from 22 British authors, mostly practising veterinarians. A wide range of topics is thus covered, generally in a concise and practical way. Basic nutritional concepts and the feeding of healthy and diseased dogs and cats, the identification and treatment of ectoparasites and helminths, and the principles of quarantine are discussed in the first few chapters. This is followed by a good chapter on the care of pregnant bitches, normal parturition, dystocias and the care of new-born puppies. Short notes on hip dysplasia and progressive retinal atrophy, cat and dog breeds and bandages, dressings and splints complete the first section. The second section contains useful information concerning the handling, feeding and nursing of birds, rats, mice, hamsters, guinea-pigs, rabbits and also snakes, lizards, geckos, iguanas, chameleons, turtles, terrapins and tortoises. In the third section the history, symptoms and treatment of common small animal emergencies are listed. This is followed by notes on fluid, electrolyte and acid-base balance and commonly used replacement fluids. Urine analysis, faecal examination, haematology and some blood chemistry, and very short notes on X-ray examinations, are also included in this section. The fourth section is devoted to the classification of drugs and pharmaceutical preparations, sulphonamides, antibiotics and hormones (including corticosteroids and insulin). The appendix contains some useful conversion tables and notes on sterilisation, instrumentation and colours of anaesthetic cylinders. The book could become a useful aid in the teaching of veterinary nurses and could also serve as a readily accessible reference work for nurses in practice. It is limited, however, to the nursing of small animals under British conditions and as such would be incomplete for veterinary nurses in Southern Africa.

P.B. v.d. B.

CASE REPORT **GEVALVERSLAG**

BILATERAL MYCOTIC MYOSITIS, OSTEOMYELITIS AND NEPHRITIS IN A DOG CAUSED BY A CEPHALOSPORIUM-LIKE HYPHOMYCETE

CHERYL E.M. HAY*, R.K. LOVEDAY†, B.M.T. SPENCER‡ and de B. SCOTT§

ABSTRACT: Hay, Cheryl E.M.; Loveday R.K.; Spencer B.M.T.; Scott de B. **Bilateral mycotic myositis, osteomyelitis and nephritis in a dog caused by a Cephalosporium-like hyphomycete.** *Journal of the South African Veterinary Association* (1978) **49** No.4 359–361 (En) Faculty of Veterinary Science, University of Pretoria 0110, Onderstepoort, Rep. South Africa.

A mycetoma like syndrome in a dog caused by a hyphomycete reminiscent of *Acremonium hyalinum* (Sacc.) W. Gams, is described. The organism was seen in smears of pus and sections from the kidneys and myocardium and was isolated in pure culture from the lesions.

INTRODUCTION

This report deals with the isolation of a fungus not previously described as pathogenic, and not previously isolated in South Africa, from a chronic suppurating infection involving both hind limbs and the kidneys of a dog. The lesions resembled those of mycetoma but granules were not present.

Mycotic mycetoma is a relatively rare condition in animals. Most of the published cases and suspected cases have been reviewed by Brodley, Schryver *et al* (1967)[5], Kurtz, Finco & Perman (1970)[10] and Jang & Popp (1970)[9]. Muller, Kaplan *et al* (1975)[12] refuted certain of these cases on the grounds that, in the absence of granules, mycoses caused by dematacceous fungi should be known as phaeohyphomycoses and not mycetomas.

In man mycetomas are characterized by localized infection of the hands and feet which rarely spreads to the internal organs. The fungal elements in affected tissues usually aggregate into granules. The nature, size and colour of these granules are characteristic of the organism responsible for the disease. Draining sinus tracts may develop from which granules and pus are discharged[5]. The disease is caused by several Actinomycetes as well as Eumycetes of the genera *Allescheria, Phialophora, Leptosphaeria* and *Cephalosporium*[11 14].

In dogs, the disease caused by *Nocardia* spp. and *Actinomyces viscosum* is well known as nocardiosis[1], and is relatively common. Eumycotic mycetomas and phaeohyphomycosis are, on the contrary, rare. The organisms isolated from these conditions in dogs include *Curvularia geniculata*[5 7], *Allescheria boydii*[3 9 10] and *Dreschlera (Brachycladium, Helminthosporium) spicifera,* the imperfect state of the ascomycete *Cochliobolus spicifera*[4 10 13].

HISTORY AND CLINICAL FINDINGS

A four year old black and tan spayed Alsatian bitch was admitted to the Department of Medicine at Onderstepoort Veterinary Faculty with a history of head tilt to the right side and instability of gait particularly affecting the hind limbs. The head tilt had started some six months previously and had been ascribed to an injury, as otitis was not present.

The animal slowly recovered then suddenly regressed some three weeks prior to admission. Instability of gait was coupled with some wasting of the hind limbs, particularly the left hind leg. Irritability and anorexia developed 10 d prior to admission. The bitch had previously suffered once from biliary fever (*Babesia canis* infection). The diet consisted of pellets and raw meat.

Clinical examination revealed a slight head tilt to the right side; otoscopic examination did not, however, reveal any evidence of inflammation or infection. There was a tonsillitis and slight pyrexia. The gait was unsteady and there was marked wasting of the hind limbs, although there was no evidence of pain on palpation. Urinalysis showed the presence of protein and casts but the blood urea nitrogen was normal. Haematological findings were within normal limits.

Parenteral treatment with penicillin-streptomycin was instituted. The tonsillitis regressed but the animal remained pyrexic and anorexic. The lameness of the hind limbs worsened and an X-ray examination was made. This showed bilateral osteomyelitis of the femur in the mid-shaft area.

Antibiotic therapy with chloramphenicol was then instituted. The animal deteriorated rapidly and euthanasia was performed after consultation with the owner.

PATHOLOGY

At necropsy advanced osteomyelitis of both femurs with sinus formation extending part way through the quadriceps group of muscles was found. A thick purulent discharge, bright pink in colour, was found in the sinus. It did not contain granules. The muscles and interstitium in the area of the osteomyelitis were also a bright pink colour.

Chronic nephritis was present. Focal pale areas in the epicardium and endocardium, extending into the myocardium, were also seen.

No lesions were found in the brain or the ear canal which could account for the head tilt.

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HISTOPATHOLOGY

Smears made from pus exuding from the sinus in the quadriceps muscles of the left hind leg were stained with 10% Giemsa for 20 min. Examination of these smears showed numerous hyaline hyphal fragments, septate and with bulbous swellings, superficially resembling the tissue phase of *Allescheria boydii*. Granules were, however, not present.

Histopathological examination of the kidneys stained with G.M.S.[2] and Gridley's[8] stains showed the presence of hyphal elements similar to those described above. These hyphae were located mainly in the medulla, but there were also a few scattered foci in the cortex (Fig. 1).

Around the hyphae were granulomatous areas consisting mainly of macrophages with a few neutrophils and rare giant cells (Fig. 2). A few foci were encircled by increased connective tissue and some were associated with cells resembling epithelioid cells.

Sections of myocard showed fairly numerous disseminated foci of myocarditis characterised by necrosis of the myocardial cells and infiltration by macrophages and a few neutrophils. Numerous fungal elements were demonstrated in these foci after staining with G.M.S.

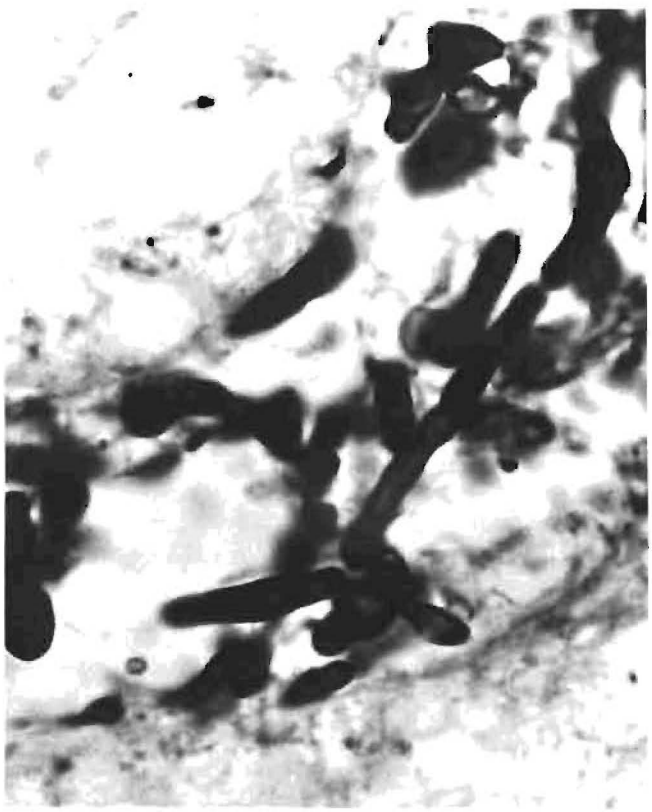

Fig. 1. Section of dog's kidney (100 x 1,25) stained G.M.S., showing fungal elements of *Acremonium hyalinum*.

MYCOLOGY

Specimens were taken from the pus and portions of tissue from the affected hind limbs for culture. These were plated out on Sabouraud's dextrose agar and on the same medium containing 250 mg/ℓ chloramphenicol. The cultures were incubated at 28°C and 37°C. Growth was seen after 5 d at 37°C and after 9 d at 28°C. The colonies were white to pale green with a characteristic elevated beard-like projection in the centre. After 21 d at 28°C the cultures on chloramphenicol agar produced a dark green pigment which seeped into the agar under and around the colony.

Under the microscope the hyphae were seen to be hyaline and septate. Oval conidia were produced from erect, branching phialides. No other fungal or bacterial organisms were isolated from the specimens, although numerous colonies of the suspected pathogen were found on all plates inoculated.

The culture was submitted to Dr W. Gams of the Centraal Bureau voor Schimmel Culturen in Baarn. Dr Gams replied as follows: "It is reminiscent of *Acremonium hyalinum* (Sacc.) W. Gams, but the conidia are mostly formed in dry heads instead of chains, and the phialides are often shorter. It grows well at 37°C[7]."

DISCUSSION

A. hyalinum belongs to the group of fungi loosely termed "Cephalosporium – like Hyphomycetes"[6]. *C. falciforme* and *C. acremonium* cause eumycotic mycetomas in man[4]. *A hyalinum*, however, has not been previously described as a pathogen of either man or animals and the reference strain is not described as growing well at 37°C[6], although the organism isolated from this Alsatian bitch did so.

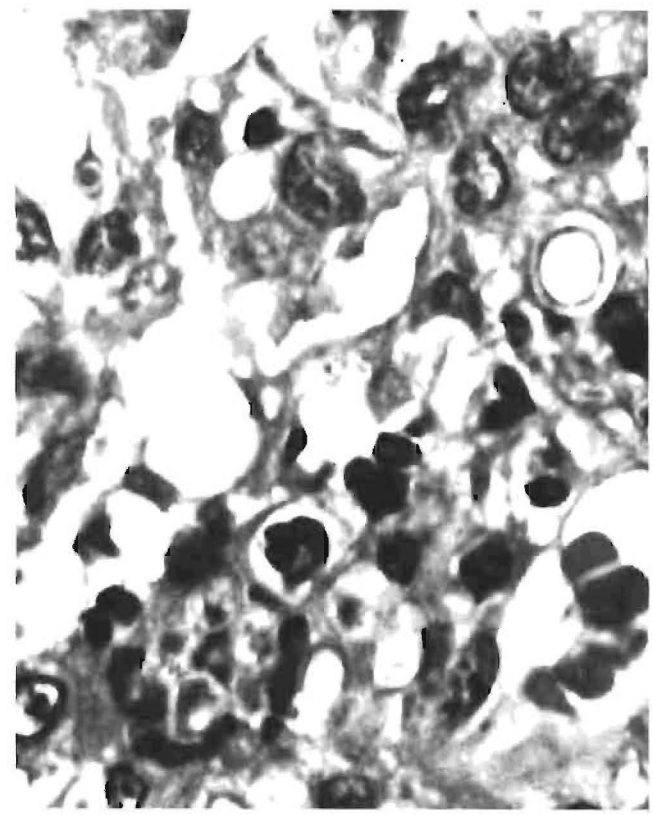

Fig. 2. Section of dog's kidney (100 x 1,25) stained H.E. showing the cellular changes.

The lesions seen were not characteristically those of a mycetoma, as they were not limited to the peripheral

tissues and there was no evidence of granule formation. Nevertheless, it cannot, be described as a phaeohyphomycosis, as the hyphae are not dematacеous. It was therefore decided to describe the disease in terms of the lesions encountered, i.e. as a bilateral mycotic osteomyelitis, myositis and nephritis.

The pathogenesis of the disease is difficult to unravel. The fungus may have entered through skin lesions on the hind legs caused approximately a year earlier when the dog was in the habit of clambering over its owner's fence. The chronic nephritis may have aggravated the condition by lowering the animals resistance: it may, on the other hand, have been the result of the infection. The origin of the slight head tilt remains obscure.

ACKNOWLEDGEMENTS

We express our profound gratitude to Dr W. Gams for his efforts towards identifying the pathogenic fungus. We also convey our thanks to Prof. R.C. Tustin of the Dept. of Pathology, Faculty of Veterinary Science, University of Pretoria, for his elucidation of the histopathology.

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BOOK REVIEW

BOEKRESENSIE

THE SI FOR THE HEALTH PROFESSION

WORLD HEALTH ORGANIZATION, GENEVA*, 1977

pp. 75, Many Tables, Price not stated

This is an excellent book with all the necessary information about the International Metric (SI) system.

Veterinarians can use this book well. It has accurate conversion tables and any substance can easily be found in the alphabetically arranged list.

D.J.G.

*WHO publications in South Africa are handled by Van Schaik's Bookstore (Pty) Ltd., P.O. Box 724, 0001 Pretoria.

TO THE EDITOR

AAN DIE REDAKSIE

COLIFORM MASTITIS AND SAWDUST BEDDING

Sir,

With the increasing attention being paid to mastitis control and especially coliform mastitis, a record of a severe outbreak of the latter in this area may be of interest.

The outbreak occurred in dairy cattle, on the zero grazing system and housed in cubicles, with sawdust being used as bedding material. The sawdust is removed only when it becomes very soiled, although dung pats are removed daily. Removal is carried out by hose-pipe jet sprays, the liquid eventually being used as slurry. For this reason, other bedding materials are not entirely suitable. The dairy water is chlorinated.

The herd of 500 cows is highly productive and heavily fed. The usual mastitis precautions have been in operation for many years and include dry cow therapy, machine check, teat dipping, strip cow, etc. The herd is one of those engaged on a routine Somatic Cell Count (SCC) with regular veterinary supervision and the submission of mastitic milk from clinically affected cows. The outbreak came to light because of this supervision, but in fact it seems probable that cases had occurred over several years with a variety of antibiotics being used for treatment.

Clinical symptoms were typical, including sudden onset, pyrexia, the affected quarter being hard, painful with the quarter secretion reduced to a watery liquid with yellowish clots, sometimes blood tinged. *E coli* was recovered in pure culture in all cases. Twelve cows were involved and in one day twelve affected quarters were confirmed as coliform mastitis. With some reluctance the owner agreed to change the bedding material to straw and within a week cases had ceased.

It is worth recording that all of the cows affected had shown a low SCC during a recent survey, suggesting that they had a lesser degree of resistance to *E. coli* infection because of low udder leucocyte concentration.

Eberhart[1] has demonstrated in trials with various bedding materials that *E. coli* and *Klebsiella* organisms appear to thrive in sawdust and this build up can lead to outbreaks of coliform mastitis.

Vaccination of cows with a polyvalent *E coli* vaccine has been discarded as impractical, as has sterilisation of sawdust by heat or by formalin, etc. It appears that one can only advise farmers not to use sawdust as a bedding material.

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REFERENCE

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TOXICITY OF *SWARTZIA MADAGASCARENSIS DESV.*[1]

Sir,

In April 1975 incidents of "urea poisoning" were reported on a farm 30 km north of Marandellas, Rhodesia. The animals involved were mature Hereford-cross breeding cows, on normal, very well managed veld grazing supplemented by a urea-containing lick mixed by the farmer himself.

On arrival at the farm, two dead cows were autopsied. From the posture of the animals it could be seen that death was acute, with no symptoms whatsoever: the animals had literally collapsed and died, severely bloated. The usual symptoms associated with urea poisoning were not seen. Because the lick was homemade, the farmer himself suspected the lick but on analysis it contained no more than 3% urea and was very well mixed. The animals had been moved into the camp some 48 h earlier. Of the 900 odd cows in various camps on the farm, this was the only camp where death had occurred in spite of the fact that all animals were on the lick.

Post-mortem examination revealed exceedingly large amounts of *Swartzia* pods all partly broken up in the rumens of both cows but very little else. Ruminal pH was definitely alkaline. The pods were submitted to the veterinary Research Laboratory, Dept. of Vet. Services[2] in Salisbury, where they were identified as *Swartzia madagascarensis* pods. On analysis these pods were shown to contain urease and saponins.

With this in mind the cattle were moved out of the camp into another where no further deaths occurred in spite of the urea lick being present. It is of interest to note that, after the initial examination, the urea lick was immediately withdrawn and the deaths stopped. Cattle are extremely fond of the pods of this tree and consume large amounts. Once the possible danger of combining these pods with a urea-lick is recognized by management it is very easy to control.

The problem was subsequently diagnosed on a number of other properties and it is of interest to note that in the Lowveld area of Mayo/Mtoko, the same problem occurred but here nervous symptoms were seen; the condition was definitely more protracted. Treatment in all cases was of no avail.

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CASE REPORT **GEVALVERSLAG**

OESTROGEN-INDUCED BONE MARROW APLASIA IN A DOG

P. BLAND-VAN DEN BERG*, L. BOMZON† and A. LURIE‡

ABSTRACT: Bland-van den Berg P.; Bomzon L.; Lurie A. **Oestrogen-induced bone marrow aplasia in a dog.** *Journal of the South African Veterinary Association* (1978) **49** No. 4 363–365 (En) Dept. Med., Fac. Vet. Science, Univ. Pretoria, Box 12580, 0110 Onderstepoort, Rep. of South Africa.

A case of oestrogen toxicity in the dog is described. The bone marrow was primarily affected with resultant non-regenerative anaemia, leukocytosis followed by leukopaenia, and thrombocytopaenia. Endometritis, toxaemia and disseminate intravascular coagulation were complicating factors. The case terminated fatally despite intensive therapy.

INTRODUCTION

Clinical and experimental cases of oestrogen toxicity in the dog have been well documented[1 2 3 4 6 8 9]. Despite this practitioners are often unaware of the potentially disastrous effects of oestrogen overdosage. This report illustrates the severe myelo-depressive effects of oestrogen overdosage.

CASE REPORT

A four-year old Dalmatian female, weighing 25 kg, was presented (Day 1) for termination of a three-week-pregnancy. Oestradiol cypionate§ 12,5 mg was administered by intramuscular injection,followed by 5 mg of stilboestrol per os, daily for 7 d. Treatment was based on recommendations for the termination of early pregnancy[5]. The suggested schedule is 0,5 mg/kg of stilboestrol by intramuscular injection, followed by 0,2 mg/kg of stilboestrol daily per os for 7 d. Oestradiol, which has 10 times the potency of stilboestrol[7], was inadvertantly used for the initial injection. On Day 12 the dog was presented with anorexia, a rectal temperature of 39,7°C, polydipsia, swelling of the eyelids, difficulty with locomotion, arched lumbar spine, retracted abdomen and a haemorrhagic vulvar discharge. No *Babesia canis* parasites were detected in the blood smear. The dog was treated for endometritis with 250 mg of ampicillin† t.i.d. per os. A full blood count at this stage showed a neutrophilic leukocytosis and severe thrombocytopaenia (Fig. 2 & 3). On Day 14 there was anaemia, neutrophilic leukocytosis, thrombocytopaenia and a lack of reticulocyte response (Fig. 1, 2 & 3). Antibiotic therapy was continued and tranexamic acid*, 500 mg t.i.d. per os, added because of increasing vulvar haemorrhage. On Day 15 the dog was weak and unable to walk. Haematological investigation indicated a worsening anaemia, pronounced leukocytosis, neutrophilia, monocytosis, thrombocytopaenia and a low

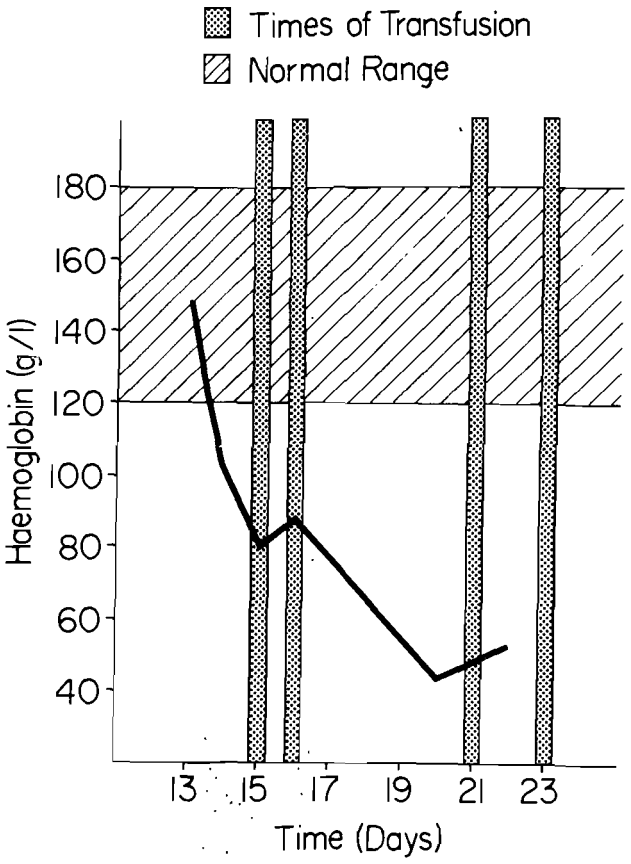

Fig. 1. Haemoglobin concentration (g/ℓ).

reticulocyte count (Fig. 1, 2 & 3). Fresh whole blood (500 ml) and methylprednisolone† 10 mg were administered, following which there was some clinical improvement. Approximately 9 h after the transfusion the dog developed "eclampsia-like" symptoms with a high rectal temperature(40,8°C), rapid shallow respiration and a ventricular heave. Calcium gluconate‡ 3 g was injected intravenously and the symptoms subsided gradually over a period of 4 h. On Day 16 the dog was referred to the Department of Medicine, Faculty of Veterinary Science, University of Pretoria, for further management. Clinical examination at this stage revealed a

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§ECP – Upjohn (Pty) Ltd.
†Penbriten – Beecham Pharmaceuticals (Pty) Ltd.
*Cyklokapron – Pharmacal Division of Saphar M.L. Lab., Johannesburg.

†Depo-Medrol – Upjohn (Pty) Ltd.
‡Calcium gluconate B.P. – Propan Pharmaceuticals (Pty) Ltd.

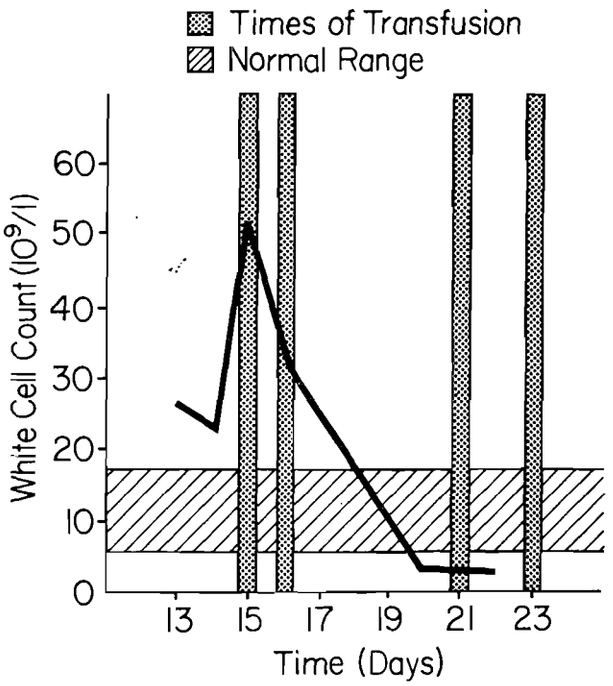

Fig. 2. The total leukocyte count (x $10^9/\ell$).

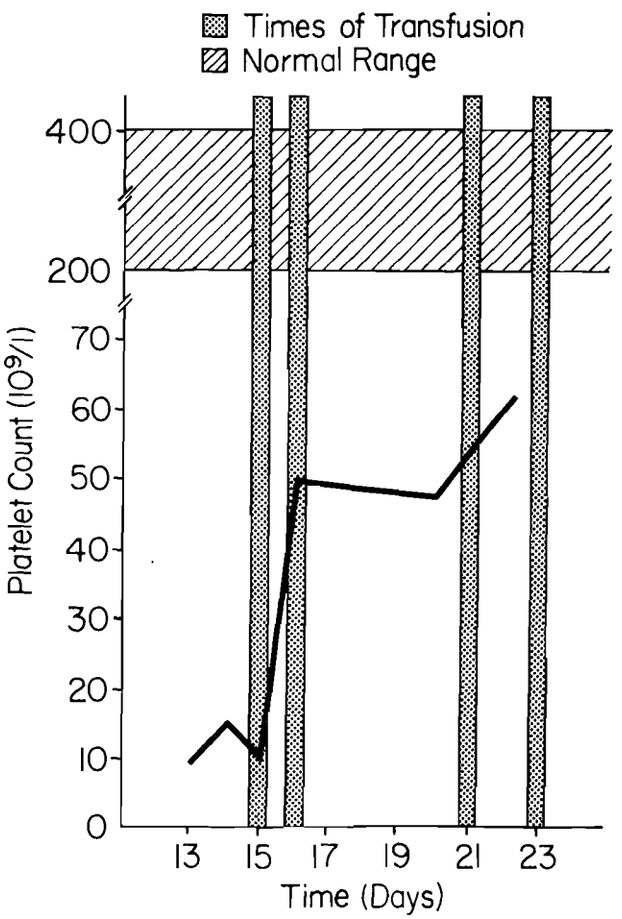

Fig 3. The total platelet count (x $10^9/\ell$).

depressed habitus, high rectal temperature, waterhammer pulse, pale mucous membranes, harsh bronchial sounds, palpably enlarged uterine horns, profuse haemorrhagic vulvar discharge, melaena, and a stiff, painful gait. Haematological investigation again indicated anaemia, neutrophilic leukocytosis with a left shift, thrombocytopaenia and a low reticulocyte count (Fig. 1, 2 & 3). A small number of *B. canis* parasites was detected in the blood smear. Serum enzyme determinations were normal. A blood clotting time was normal, although the fibrinogen level was mildly reduced (2,87 g/ℓ) and increased levels (40 μg/100 mℓ) of fibrin degradation products (FDP's) were detected. Urine analysis indicated the presence of moderate numbers of erythrocytes and large numbers of leukocytes and renal tubular epithelial cells. Treatment at this stage consisted of cross-matched whole blood, ampicillin, essential amino acids*, essential phospholipids†, B complex vitamins‡ and nandrolone laurate§. Imidocarb¶ at 5 mg/kg was used to control the *B. canis* infection. There was no improvement over the next few days despite continued intensive therapy. On Day 20 repeat investigation indicated severe anaemia, leukopaenia, neutropaenia, relative lymphocytosis, thrombocytopaenia and a further drop in the reticulocyte count (Fig. 1, 2 & 3). Another cross-matched blood transfusion was administered. On Day 21 severe icterus was observed. Haematological examination on Day 22 showed a persistent pancytopaenia. Bone marrow aspiration was attempted from the iliac crest, but consisted mainly of peripheral blood. No erythroid or myeloid precursor cells and no megakaryocytes could be demonstrated. Despite a further blood transfusion the dog died on Day 23.

Post-mortem examination revealed severe anaemia, icterus, and petechial haemorrhages in the subcutis, skeletal musculature, lymph nodes, heart, lungs, diaphragm, gastrointestinal tract, mesentery and kidneys. A subacute focal pneumonia was present as well as moderate hydrothorax and hydropericardium. Hepatic degeneration, hepatosplenomegaly and nephrosis was evident. A number of myocardial, splenic and renal infarcts were observed. Severe endometritis associated with foetal resorption was present. A striking finding was the severe anaemia without any evidence of compensatory bone marrow metaplasia.

Microscopic examination confirmed the presence of parenchymatous organ degeneration, thrombosis, infarction and haemorrhage. The presence of intravascular fibrin deposits was further demonstrated using Martius scarlet-blue stain. Examination of bone marrow sections indicated a complete absence of myeloid and erythroid precursor cells and megakaryocytes.

The clinical and *post-mortem* findings suggested severe bonemarrow depression, possibly as a result of oestrogen overdosage. Disseminate intravascular coagulation (DIC) possibly resulting from endometritis and endotoxic shock was also seen.

*Proteplex – Burns (S.A. Cyanamid)
†Hepavet – Hoechst Pharmaceuticals (Pty) Ltd
‡Parentrovite – Beecham Pharmaceuticals (Pty) Ltd
§Laurabolin – Intervet, Boxmeer, Holland.
¶Imizol – Coopers (S.A.) (Pty) Ltd.

DISCUSSION

Although the pathogenesis remains uncertain the severe myelodepressive effects of oestrogen toxicity are well described[1 3 4 6 8 9]. Initial depression of erythroid and megakaryocytic cells, accompanied by marked myeloid hyperplasia, is followed by myeloid atrophy and virtual complete disappearance of all myeloid and erythroid elements[1 3]. These bone marrow changes are initially reflected in the peripheral blood by a non-regenerative anaemia, leukocytosis and thrombocytopaenia. This is followed by anaemia, leukopaenia, neutropaenia, relative lymphocytosis and thrombocytopaenia[4 6 8 9]. The clinical consequences include depression, weakness, anaemia, secondary infection and a haemorrhagic tendency[2 6 8 9]. Severe cases are invariably fatal[8 9]. These characteristic clinical and laboratory findings were well demonstrated in our patient which had received a dose of oestrogen equivalent to 160 mg of stilboestrol.

Post-mortem findings are characterized by anaemia, haemorrhages, parenchymatous organ degeneration and depletion of bone marrow stem cells[1 3 8 9]. These lesions were present in the case described above. In addition DIC characterized by intravascular fibrin deposition, thrombosis, infarction and haemorrhage, was observed. The elevated FDP levels demonstrated on Day 16 may have been the first indication of developing DIC. It is assumed that endotoxic shock following endometritis was the main factor leading to the development of DIC. Nevertheless, post-transfusional haemolysis and jaundice following transfusion on Day 20 may have been contributing factors. The role of oestrogen toxicity in the development of DIC is not known.

ACKNOWLEDGEMENTS

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LETHAL GENES IN CATTLE – RECOGNITION OF THE CARRIER STATUS

Question:

Every now and then the breeder or the breeding association is confronted with the problem of lethal factors in breeding herds: a bulldog or "otter" calf is born! Are techniques available to identify the carrier of these lethal genes?

Answer:

Lethal genes would constitute no special problem if there were some simple methods of detecting their presence in the carriers. There are several lethal genes in animals which do have a noticeable effect in heterozygotes or carriers: the best example here is the Dexter breed of cattle in which only the animals heterozygous for the gene for achondroplasia (common name: bulldog calf) are identified as Dexters. Other examples of a single dose of a lethal gene having an effect are the lethal gene for sable in ranch-raised mink or the gene for gray in Karakul or the gene for merle/harlequin in dogs.

In the vast majority of lethal and semilethal traits in farm animals – more than 40 are known to be present in cattle populations – there is no recognisable effect of the genes in the heterozygotes or carriers. If we are to reduce the frequencies of lethal or semilethal genes in our cattle population, there is at present but one alternative, namely, the tedious process of progeny testing.

Progeny testing, as used here, attempts to determine an animal's genetic make-up with respect to one or more recessive lethal genes by observing the kinds of offspring he produces in a number of matings. If, for example, a bull produces an offspring with say schistosoma reflexa (internal organs turned outwards), it is evident that both he and the mother of the defective calf are carriers of the lethal gene for that trait. If, on the other hand, a bull is mated to a considerable number of known carrier cows (i.e. heterozygous for a specific trait) and all calves are normal, he is regarded as being a non-carrier. Our problem is to decide the minimum number of normal progeny required in order to be reasonably certain that a bull may not be a carrier of a particular lethal trait. The five per cent level of significance is usually acceptable, at which level the error in deciding that an animal is homozygous normal, when in fact he is heterozygous, is no greater than 0,05. Table 1 gives all possible kinds of test matings:

Table 1: THE MINIMUM NUMBER OF PROGENY REQUIRED TO TEST A MALE AT THE 5% LEVEL OF SIGNIFICANCE FOR HETEROZYGOSITY FOR A SINGLE AUTOSOMAL RECESSIVE GENE

Test Mating	Minimum no. of progeny
Sire mated to:	
Homozygous females	5
Known heterozygous females	11
Daughters	23
Full sibs (one parent heterozygous)	23
Full sibs (both parents heterozygous)	17
Half sibs	23

It should be noted that while these tests were devised for a specific gene, the tests are valid for any locus. For example, a male that produces 23 normal and no homozygous recessive progeny from full sib, half sib, or sire-daughter matings, may be considered a non-carrier of recessive autosomal genes.

In theory, this would seem to be a desirable method but in practice it is often difficult to locate the proven carrier cows. Therefore other techniques had to be developed – the "automatic" testing of bulls for recessive lethal genes. We have little information on the frequency of individual lethal genes in our cattle populations. It seems probable that few lethals ever reach frequencies higher than 0,10 in the general population. Perhaps most of these genes exist in frequencies less than 0,05 or 0,01. Nevertheless, any of them can, and perhaps often do, reach frequencies much higher than 0,05 in individual herds. High frequencies are sometimes obtained in only a few generations by following an intensive line-breeding program and increasing the relationship to an outstanding animal.

In Table 2 different gene frequencies are given and the numbers of offspring required for the testing of bulls for lethal genes appearing in different frequencies:

Table 2: "AUTOMATIC" TESTING OF BULLS FOR RECESSIVE GENES

Gene frequency (q) in the cow population	0,02	0,05	0,1	0,2	0,3
Frequency of aa segregation after each mating when an Aa bull is used	0,01	0,025	0,05	0,1	0,15
Probability P(WrC)*	Number of offspring required in order to reduce the probability that the bull might be a carrier (Aa) to stated levels.				
<0,05	304	124	64	34	24
<0,01	467	191	99	53	38
<0,001	701	287	148	79	56

*Probability of wrong conclusion.

It can be seen that 304 random healthy offspring from a bull are required if the gene frequency of the lethal gene is 0,02 in the population. Then, the probability of a wrong conclusion is 0,05 or, in other words, a certainty of 95 per cent is obtained that the bull in question is not a carrier of the particular gene – or for that matter not a carrier of any lethal or semilethal gene. In an A.I. organisation, thus, it is necessary to keep complete records of the first 304 calves born and you will have a 95 per cent certainty that the bull will not pass on any of the long list of lethal or semilethal genes!

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VRAE EN ANTWOORDE

QUESTIONS AND ANSWERS

Vraag:

"Chlooramfenikol word deur baie in 'n spesiale kategorie onder die antibiotika geplaas. Wat is die bruikbaarheid daarvan in die veeartsenypraktyk en watter voorsorgmaatreëls moet getref word om doeltreffendheid te verseker? Watter nadele en moontlike gevare word gekoppel aan Chlooramfenikol en hoe moet die middel gebruik word om sodanige gevare uit te skakel?"

Antwoord:

Algemeen

Chlooramfenikol as antibiotikum is in 1947 uit *Streptomyces venezuelae* geïsoleer. Daarna is dit sinteties vervaardig. Chemies is dit 'n derivaat van dichloorasynsuur met 'n nitrobensiengedeelte. Die biologies-aktiewe vorm is die laevo-isomeer en daar is ook nog drie onaktiewe vorms bekend. Chlooramfenikol is swak wateroplosbaar, goed oplosbaar in propileenglikol maar onoplosbaar in plantaardige olies.

Clooramfenikol het 'n breë spektrum van antimikrobiese aktiwiteit. Die werking is gewoonlik bakteriostaties maar afhangend van die organisme en die konsentrasie mag die werking wel bakteriolities wees. Gram-positiewe sowel as Gram-negatiewe bakterieë word aangetas, daarby ook *Rickettsia, Chlamidia* en *Mycoplasma* species. 'n Bloedpeil van 5 – 10 μg/ml word in die algemeen as voldoende beskou.

Die werking van die antibiotikum berus daarop dat proteïensintese in bakterieë inhibeer word. In die soogdiersel vind ook inhibisie van proteïensintese plaas, daarby word proteïensintese in die mitochondria ook inhibeer. Hierdie inhibisie word toegeskryf aan die bevinding dat die koppeling van RNA aan ribosome verhinder word. Chlooramfenikol inhibeer die opneem van Fe in die retikulosiet en die binding van Fe by hemoglobienvorming. Gevolglik styg die konsentrasie van Fe in die plasma.

Bakteriële weerstand teen chlooramfenikol kom voor in bakterieë en kan ontwikkel as vatbare bakterieë aan lae konsentrasies blootgestel word. Die weerstand in bakterieë is as gevolg van die teenwoordigheid van 'n ensiem (chlooramfenikolasetieltransferase) wat chlooramfenikol inaktiveer deur vorming van mono- en di-aseto derivate wat geen antibakteriese werking besit nie. Hierdie asetieltransferase kan teenwoordig wees in sekere Gram-negatiewe bakterieë by *E. coli* (R-faktor draer) of kan in die bakterium ontwikkel as dit aan die middel blootgestel word, bv. *S. aureus*. Dit dien daarop gelet te word dat Watanabe bewys het dat R-faktore oorgedra kan word na bakterieë wat geen R-faktore besit nie.

Absorpsie, Distribusie en Uitskeiding

Na orale dosering aan skape en beeste word geen chlooramfenikol in die bloed gevind nie omrede dit deur organismes van die rumen afgebreek word. By skape is wel gevind dat dosering in die abomasum hoë bloedpeile tot gevolg het. Na orale dosering aan perde word bloedpeile wel verkry.

By honde word chlooramfenikol vinnig na orale toediening absorbeer. Die handhawing van bloedpeile in die hond is moontlik daaraan te wyte dat 'n gedeelte van die geïnaktiveerde chlooramfenikol deur die gal uitgeskei word en in die dermkanaal gehidroliseer word na die aktiewe vorm wat herabsorbeer word. In diere is ongeveer 40 % van die geabsorbeerde chlooramfenikol aan proteïen gebonde. Die middel versprei vinnig na alle weefsel en daarna is chlooramfenikol teenwoordig in die ekstra- sowel as intrasellulêre vloeistof. Hoë peile is ook teenwoordig in pleurale sowel as serebrospinale vog. Weefselkonsentrasies is hoog en die hoogste konsentrasies word gevind in die lewer, gal en nierweefsel. Die middel gaan ook deur die plasenta en konsentrasies so hoog as 75 % van die bloedpeil kan in die fetus gevind word. Plaaslike aanwending van chlooramfenikol as 'n salf op die kornea kan aanleiding gee tot spore van die middel in bloed en urine.

Uitskeiding en biotransformasie vind vinnig plaas. In die lewer vind glukoronisasie van chlooramfenikol plaas terwyl uitskeiding hoofsaaklik deur die urine plaasvind. Slegs sowat 6 % van die middel wat in die urine voorkom, is in die aktiewe vorm. Aktiewe chlooramfenikol word ook in melk uitgeskei. Afhangend van die dosis, kan dit teen terapeutiese konsentrasies wees. In gevalle van akute mastitis is die konsentrasies in melk effens hoër as in normale diere. Chlooramfenikol kan die werking van ander middels wat toegedien word beïnvloed, so bv. word die biotransformasie van difenielhidantoïen vertraag en die duur van narkose met pentobarbitoon in honde en katte verleng.

Dosis

Hond: Groot individuele variasie ten opsigte van absorpsie word na orale toediening gevind. 'n Dosis van 50 mg/kg massa drie of vier keer per dag sal 'n terapeutiese bloedpeil handhaaf. Geen voordele kan met parenterale toediening bo orale dosering gevind word nie.

Perd: Chlooramfenikol se halfleeftyd ($t_{½}$) is ongeveer een h en daarom moet groot dosisse van 30 mg/kg massa elke vier h intraveneus toegedien word. Intramuskulêre toediening van selfs soveel as 50 mg/kg lei nie tot 'n terapeutiese bloedvlak nie.

Bees: Hier is die $t_{½}$ ongeveer 3,5 h. 'n Dosis van 30 mg/kg driemaal per dag intramuskulêr toegedien sal voldoende bloedpeile handhaaf.

In die algemeen word die bewering gemaak dat veeartse die middel teen 'n te lae dosis toedien en dat veral die herhaling van toediening met 'n te lang tussenpose gedoen word.

Toksisiteit

In diere is die toksisiteit van chlooramfenikol van baie min belang; diere is blykbaar minder gevoelig vir die middel en toediening geskied selde oor 'n lang tydperk.

In honde kon geen tekens van vergiftiging verwek word met 50 mg/kg tweemaal per dag oraal toegedien nie. 'n Dosis van 150 mg/kg tweemaal per dag het 'n verlies in aptyt in die meeste proefdiere na 5 dae ver-

oorsaak. Daling in die retikulosiettelling dien ook as bewys van onderdrukking van die beenmurg. Miëlogramme het onderdrukking getoon oor 'n tydperk van 21 dae waartydens die middel gedoseer was. Na staking van toediening het volkome herstel na 21 dae plaasgevind.

In katte is bevind dat 100 mg/kg tweemaal per dag vir sewe dae ook beenmurgaktiwiteit onderdruk maar ander navorsers kon dit nie herhaal nie en het net verhoging van Fe-konsentrasie in serum gevind. In beeste mag chlooramfenikol die motiliteit van sperme beïnvloed asook moontlik chromosoomabnormaliteite induseer. Of hierdie effekte van enige praktiese belang is word egter betwyfel.

In die mens word veral twee vorms van toksisiteit van belang geag:

1. Tydelike beenmurgonderdrukking. Hier ontwikkel anemie met eritroïede hipoplasie; soms ontwikkel ook 'n trombositopenie en leukopenie.
2. Dodelike pansitopenie. Hierdie verskynsel is nie afhanklik van die dosis nie en daar is verskille in individuele vatbaarheid. 'n Mortaliteitsyfer van 4 per miljoen mense blootgestel aan chlooramfenikol word genoem. Hierdie toestand kom veral voor as chlooramfenikol by herhaling gebruik word of oor 'n lang tydperk toegedien word.

Ander hipersensitiwiteitsreaksies soos bv pruritus kom baie selde voor.

Residue

Chlooramfenikol gegee aan lê-henne teen 'n dosis van 40 d p m in die voer vir vyf dae het gelei tot 'n residu in die eiergeel van 0,33 d p m en 0,17 d p m in die albumen. Na toediening gestaak is, het dit vir nog 76 h in die albumen en 108 h in die geel voorgekom. By braaikuikens het dieselfde toediening 0,2 d p m in vleis, lewer, vel en vet veroorsaak en 0,6 d p m in nierweefsel. Na 48 h kon geen chlooramfenikol in spier en lewer gevind word nie. Uit die vel en vet het dit reeds binne 8 h verdwyn. In die nier was daar 0,3 d p m na 72 h.

By slagdiere verdwyn chlooramfenikol uit die weefsel 24 h nadat 'n intraveneuse toediening gegee is en 48 h na orale dosering. Daar is skrywers wat meen dat meer aandag aan bogenoemde gegee moet word wanneer daar oor hierdie middel besin word. Dit word daarop gewys dat chlooramfenikol hittestabiel is en residue in dierlike produkte sal nie met normale voorbereiding vernietig word nie. Hierdie feit is egter net van toepassing om toksiteit in die mens te voorkom. Die gevaar van bakteriële weerstand en die oordrag daarvan bly nog egter van pas.

Die Amerikaanse FDA het 'n verbod geplaas op die gebruik van chlooramfenikol in slagdiere. In Kanada word die middel slegs op voorskrif van 'n veearts gebruik. In Engeland word dit aanbeveel dat die middel net gebruik word waar geen ander antibiotikum gebruik kan word nie en dan moet behandeling nie oraal geskied nie. Toestande wat vir behandeling toelaatbaar is, is bv sistemiese salmonellose by beeste, asemhalingsinfeksies van kalwers en, in 'n beperkte mate, panleukopenie van katte.

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GENERAL **ALGEMEEN**

FINANCIAL AWARENESS FOR THE VETERINARIAN IN PRIVATE PRACTICE*

J.W.E. ADAMS

ABSTRACT: Adams J.W.E. **Financial awareness for the veterinarian in private practice.** *Journal of the South African Veterinary Association* (1978) **49** No. 4, 369–373 (En) Veterinary Hospital, Hatfield, Salisbury, Rhodesia.

The need for economic awareness is stressed, and some practical aspects which the author has found helpful are described in detail. Some such examples are: linking both professional and other salaries to gross fees as an aid to motivation, cash or credit for accounts receivable, financial analysis to guide money management, and the marketing of pet vaccines.

INTRODUCTION

To set the contents of this paper in perspective, a philosophical meander is necessary. It is proposed that the overall worth of a veterinarian might be assessed thus: one third the person, one third the formal training, and one third the immediate post-graduate exposure to colleagues. The person may come from an economically attuned background, for example, a parent dealing in second hand motor cars, or, as in my case, experience in horse trading. Ideally the veterinarian should have had formal business training as part of the veterinary curriculum and should have been exposed to financially competent practitioners after qualifying.

Unhappily, it is more probable that a veterinarian will have had none of these advantages, and may never acquire expertise in this vital area. It is my observation that this lack of expertise is the norm in our profession.

Couple an ignorance of economics with the usual lack of technical confidence of a new graduate and one has a potential disaster situation. If, by good luck, the person survives in private practice, it is often at high monetary cost and great personal disillusionment. Some members of our profession may have sought refuge outside private practice because of a lack of preparation to cope with the management skills demanded in private practice.

This paper describes certain techniques and concepts that have evolved and developed in this practice over the years.

A sample "Income and Expenditure Account" is depicted in Fig. 1. This is one of the ways that accountants use to present the monthly or yearly performance of a business, in this case a veterinary practice. In the example, fixed expenses (22%) and variable expenses (33%) are itemised, while income is not. Ideally, income should be detailed at least into fees, drugs, vaccines and travel, but in our practice we are satisfied to analyse one or two months in detail (Fig. 7) annually and to extrapolate these findings to cover the financial year. In this example the balance left for payment to professional staff is 45%, which is a reasonable percentage. Fifty per cent could be regarded as good, while less than 40% is poor. If one is dissatisfied with the amount remaining for distribution to veterinarians and professional advice is sought, the inevitable reply is:

GROSS INCOME (FEES CHARGED, SALES, ETC.)	100 %
Less	
1. FIXED EXPENSES	22 %
Accountancy	
Bank charges and interest	
Cleaning contract	
Depreciation	
Electricity and water	
General expenses (flowers, tape music, donations, etc.)	
Insurances	
Photographic	
Postage and Telephone	
Printing and Stationery	
Rent	
Repairs and renewals	
Staff refreshments	
Subscriptions	
Travel (continuing education/congresses)	
2. VARIABLE (FEE-LINKED) EXPENSES	33 %
Animal food	
Bad debts and collection costs	
Drugs	
Outside laboratory charges	
Motor expenses and mileage	
Staff salaries	
	55 %
Balance for distribution to veterinarians	45 %
	(40 %–50 %)

Fig. 1. Income and expenditure (profit and loss) account

"Decrease expenses and increase gross income." This is all very well, except that one is rarely told HOW this may be achieved, although 18 possible categories of accounting services can be suggested (Fig. 2). Perhaps it is unreasonable to expect a non-veterinarian to be able to indicate the steps necessary to follow the very good advice given above? I know of an instance where, in the face of a diminishing NETT income, a very reputable accountant gave just that advice, no more, and promptly increased his fee to our unfortunate colleagues!

Accounting system review	Financial statement preparation
Budget preparation	Income tax planning
Building location analysis	Insurance form processing
Cash control guidance	Insurance review
Client scheduling assistance	Investment program review
Aid with collections	Organization analysis
Cost control review	Tax return preparation
Estate planning guidance	Room layout analysis
Financing guidance	Personnel management
guidance	

Fig. 2. Services provided by accountants

*Paper presented at the Biennial National Scientific Veterinary Congress, Grahamstown, August 1977.

A clear understanding of what comprises the "business" of a veterinary practice (Fig. 3) is needed before one can achieve increased NETT income. Those aspects selected for detailed description are marked with an asterisk.

PREMISES (AAHA Standards)
- Siting
- External appearance
- Internal design
- Maintenance

STAFF
- Communications
  - Client ↔ Client ← → Receptionist
  - Veterinarian ↔ Veterinary aid
- Training + qualifications } = Performance
- Enthusiasm + motivation }
- Formal contracts of service (job description)

MONEY MANAGEMENT
- * Salaries linked to gross fees
- * Cash or credit (cash flow)
- * Drugs – ordering, receiving, costing, paying
  - Cost of failure to charge
- * Practice analysis expenses
  - income

MARKETING
- Services: Alert receptionists
  - Alert veterinarians
  - Hand-outs e.g. dentistry, deworming, spaying, castrating, etc.
- Drugs and remedies, e.g. tick and flea washes, deworming
- * Vaccines
- * Quoting and costing

PROMOTION
- Personal efforts in community
- Associations efforts in community – e.g. schools, radio, TV

MISCELLANEOUS
- * Large animal contract practice
- * Levoy's "The Successful Professional Practice"
- * Conversational selling

Fig. 3. Factors contributing to the "Business" of a veterinary practice. *Indicate aspects selected for detailed discussion.

MONEY MANAGEMENT

Fee-linked salaries

1. Paying a fixed percentage of gross as a salary; or
2. Paying a fixed salary, and adding a percentage if a basic figure is exceeded.

e.g.	Basic figure	100	up to which fixed salary is paid
	Gross achieved	120	
	Excess over basic	20	
Less	Fee-linked expenses	6,66	(33%) see Fig. 1
		13,33%	

In this particular instance, a bonus of 13,33% of basic salary would be paid.

I believe that both these systems are fair, because ALL staff members participate in the success of the practice: low staff turnover and absence of complaints support this claim. It also does away with bonuses (holiday, Christmas, etc.) because everybody is participating in the month by month performance and nothing further is expected.

Cash or credit

There is no doubt that conversion to a cash system by those who have not already done so is not only possible but essential. In an earlier paper[1] our change-over has been described in detail, and it is interesting to note that since then all practices in Salisbury have changed from credit to cash. The cash basis will increase nett income by at least 6%, or maybe as much as 9–10%.

To operate a cash system basically requires the following:

1. A notice advertising the fact in the reception area*.
2. An invoice or account form (Fig 4) that can be readily prepared and handed to out-patient owners at the time of consultation or treatment, and to in-patient owners at the time of discharge.

VETERINARY HOSPITAL

Name and Address.....

Patient..... Date .....

PROFESSIONAL SERVICES				FEE
CONSULTATION AND/OR TREATMENT				
DRUGS ADMINISTERED/DISPENSED				
DEWORMING				
VACCINATIONS	3:1	Rabies	F.I.E.	
LABORATORY TESTS				
FEE				
X-RAY				
ANAESTHETIC				
SURGERY				
DENTISTRY				
HOSPITAL TREATMENTS				
HOSPITALISATION				
VISIT: EXAMINATIONS/TREATMENTS				
DRUGS				
TRAVEL				
OTHER				

SUB-TOTAL	
PREVIOUS BALANCE	
PAID	
THIS AMOUNT IS NOW DUE	

INSTRUCTIONS:

SUTURES OUT ON.....

RETURN FOR CHECK ON.....

DOCTOR.....

Fig. 4. Hospital Invoice

3. The cash system is stipulated on hospital admission forms.
4. The amount owing is communicated to owners when they are advised that in-patients are ready for collection.
5. A preparedness to talk costs and to give.a quotation where appropriate. A checklist on the reverse of the hospital admission chart has been found most useful, and this eliminates fee omissions AND subsequent disputes. The use of this checklist will be described fully under "costing and quoting" later.
6. An "Acknowledgement of Debt Form" (Fig. 5) is employed in those few inevitable instances where payment cannot be made at the time service is rendered. Non-payment is tolerated only in genuine cases of accident or illness.
7. For new clients a deposit or credit references may be required if major surgery or protracted treatment is anticipated.

ACKNOWLEDGEMENT OF DEBT FORM

Surname .....

First Names .....

Residential Address .....

.....

Telephone .....

Work Address .....

.....

Telephone .....

I, undersigned, acknowledge the debt of .....owing to Dr.....
and undertake to pay as follows .....

.....

Signed.....

Date .....

Fig. 5 Acknowledgement of Debt.

Ordered					Received		
DRUG	Supplier	Size	Quantity	Date	Size	Quantity	Date

Fig. 6 Columns in Drug Order Book.

Drugs

The purchase of drugs constitutes the second largest expenditure in a practice (after staff salaries) and deserves careful control.

We have a drug order book in which the details shown in Fig. 6 are recorded. At the time of payment of drug accounts, the invoice must agree with the "received" entries in the drug book, and the hospital price list is amended if prices have changed.

The severe loss to a practice, either by omitting to charge for drugs or by theft, is not generally appreciated. For example:

Cost price of item	$1,00	(this must be paid to supplier)
Sale price of item	$1,50	(income not increased by this amount)
Loss of gross income	$2,50	i.e. 2½ times initial cost.

Income and expenditure analysis

In our practice, income is not itemised routinely because of the amount of work involved, but during one or two months each year a full record (Fig. 7) is made, using the invoice duplicates. Providing these analyses do not differ markedly from what is expected or from previous records, the percentages are taken to apply over the year.

	Out Patients %				In Patients %				Totals			
Cons.	45	51	56	60					20	23	22	24
Vacc.	30	28	21	25	15	11	12	8	22	19	16	15
Drugs	11	14	18	10	8	11	12	7	9	12	14	8
Fee	6	5	6	3	5	5	5	8	6	5	5	6
Lab.	4	2	4	2	2	2	2	2	3	2	2	2
Surg.					50	44	40	48	28	24	24	29
Spays					38/S	44/S	42/S			9	11	12
Orthos.					14/S	12/S	8/S			3	3	2
Others					48/S	43/S	50/S			11	10	15
Dentist						1	2	1		1		0,5
X-Ray					5	9	9	9	3	5	5	5
Hosp. Rx					9	11	10	12	5	6	6	7
Hosp.					5	6	6	6	3	4	4	3
% of Gross	44	46	40	39	56	54	60	61	100	100	100	100

Fig. 7. Income analysis.

1976	Gross	Banking	Cash book balance	Debtors	Expenses	Drugs	Elec. & water	Motor & travel	Postage & telephone	Salaries	Sundries	Etc. as desired
Jan.												
Feb.												
Mar.												
Etc.												

Fig. 8. Analysis from cash book totals

*This should be done discreetly but clearly. The display of large blatant, commercial type notices could be regarded as unprofessional conduct. The receptionist should inform new clients diplomatically of the cash system. Ed.

A convenient way to monitor expenditure is to record the cash book column totals monthly (Fig. 8), so that any unexpected variation can be noticed and accounted for.

The following three examples illustrate the practical use of information learned from income and expenditure analyses:

1. In one practice the gross income over a six month period increased from 34 500 to 42 000 (7 500), which was very good – BUT expenses increased from 22 000 to 28 700 (6 700) over the same period, which almost completely offset the growth. A closer look showed that the increased income related to travel, drugs, and large animal fees, all "high cost" areas. The practitioners might just as well not have worked harder.
2. A drug income and expenditure analysis of a large animal practice showed that $14 209 drugs were sold for $15 300 – i.e. $1 100 or 7% profit, although the practice used a 50% mark up. Seven per cent was hardly a reasonable return on investment, and it was concluded that drugs were lost, stolen, or given away.
3. In this investigation the following facts about travel were established.
   (a) Overall vehicle cost per km travelled 13c
   (b) Fee charged per km travelled 15c
   (c) More than 40 h per month per veterinarian were spent travelling.
   (d) Average speed was 70 to 75 km/h.

Interpretation: Each veterinarian was not earning professional fees for one working week (40–45 h) per month and was costing the practice money by incurring motoring expenses during this time.

MARKETING

Vaccines

This is the area where enthusiastic marketing can bring the greatest return. In Rhodesia dogs require rabies immunisation by law at three months, one year and every three years thereafter. We recommend distemper/hepatitis (DH) vaccine at the same intervals. Leptospirosis vaccine is administered only on request. Infectious feline enteritis vaccinations are recommended at the same intervals as for rabies and DH. The recently introduced vaccine for infectious feline rhinotracheitis is now included in the above programme.

Our promotion of vaccines consists of:

1. Mention by receptionist where appropriate.
2. Mention during consultation.
3. A note on our information cards.
4. "Pet Papers and Health Record". This is a folder given to the client when initial vaccine is administered, which indicates when vaccines are next due.
5. The issue of certificates which also indicate the revaccination date.
6. The requirement that animals' vaccinations are valid in the terms of our recommendation on admission to hospital (Fig. 9).

The foregoing handling of our pet vaccines generated 17% of our gross income in 1975 compared with an average of 8% in South African practices surveyed[3].

While our vaccine figure may be thought to be satisfactory, a check conducted by ourselves showed that during December 1976, 33% of all dogs admitted to hospital needed either rabies or DH vaccine, or both, and 50% of the cats had no valid vaccination status. We are now introducing vaccine reminder cards to improve the situation (Fig. 10).

Vaccinations		Date of Last	Please do now
Dogs	3:1	OR	
	Rabies	OR	
Cats	F.I.E.	OR	

Fig. 9 Part of hospital record.

BOOSTER VACCINATION REMINDER

According to our records..... requires the following booster vaccination(s) now:

- ☐ Rabies
- ☐ DH (distemper (hardpad) hepatitis or 3:1)
- ☐ Infectious Feline Enteritis (cat flu)

Yours sincerely,
VETERINARY HOSPITAL

.....

.....

.....

Fig. 10. Vaccination reminder.

The impact of vaccine revenue on gross income would be even greater if annual revaccination was advised and if leptospirosis immunisation was considered necessary.

Quoting and costing

Good business practice requires that quoting and costing should be accurately and completely performed. We use a proforma on the reverse of our hospital record for this purpose. An operation costing twenty-five dollars should look like this:

FULL QUOTATION

Consultation/treatment	4,00
Vaccines (Rabies & DH)	7,00
Laboratory	5,00
General anaesthesia	5,00
Surgery	25,00
Fee (i/v therapy)	5,00
X-Ray	10,00
Hospital drugs	2,00
Hospital treatment 1 @ 3,00	3,00
Hospitalisation 2 @ 1,00	2,00
Dispensing	2,50
Deworming	2,00
Miscellaneous (tick wash)	1,00
TOTAL	$ 73,50

Without proper quoting and costing the practice will lose and clients may be justifiably dissatisfied*.

MISCELLANEOUS

Large animal practice

The future for farm animal practice lies in contract practice. The days of "fire-engine" or "disaster situation" practice are long gone.

A large animal veterinarian must involve himself in:

1. Overall herd health (prophylaxis and management).
2. The supply of drugs, remedies and vaccines to be used by the stockman on specific advice by the practitioner concerned.
3. Routine visits.
4. Encouraging the sick or autopsy cases to be brought to him to minimise professional time lost travelling.
5. Contract practice (fixed fee per head or per month). Preventing trouble must be revenue earning because the paradox of your best client possibly being the worst farmer is not good for farming nor for veterinary practice.

"The Successful Professional Practice"[2].

This is our practice bible. In our view this book is as important as a degree to a professional person in private practice.

Conversational marketing

Much legitimate business can be generated by following consciously the steps used by professional salesmen:

1. Spot the need or deficiency.
2. Prove the need or deficiency to the client.
3. Recommend your service or product.
4. Indicate the advantage of your service or product.
5. Clinch the deal.

For example, hind dew claws are present on a puppy that has come in for routine immunisation:

1. Notice the dew claws.
2. Mention unsightliness, and danger of tearing and nail penetration.
3. Recommend surgery.
4. Describe procedure etc., and quote.
5. Schedule the surgery.

A far higher percentage of suggested procedures will be performed if a definite appointment is made, than if the service is just mentioned and left to be done "sometime" in the future.

CONCLUSION

Increased profit means better facilities, better service, more and better staff, who can enjoy a better life style, and all this means better veterinary practices to the advantage of our communities and ourselves.

A well developed profit motive is largely responsible for the pre-eminence of veterinary practice in the USA and practitioners unable, or unwilling to devote attention to financial management must settle for mediocrity.

This paper has indicated the scope of management in veterinary practice and an appeal is made to both those responsible for veterinary education at university and those organising practitioner continuing education for practitioners to recognise its importance.

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*This aspect cannot be emphasised too strongly. Proper quoting BEFORE costly treatment is undertaken, and advising owners of patients when complications arise BEFORE further treatment is instituted (except in dire emergency) will obviate most of the complaints laid against practitioners. Ed.

A POSTAL GALLERY OF VETERINARY ART*

M.W. MARTIN**

Many of today's stamp collectors are taking a new approach to the world's most popular collecting hobby. For these philatelists the new direction is thematic stamp collecting. To become a thematic collector, the rules are simple: just pick a theme of interest and collect only stamps relating to that specific subject.

For the veterinary practitioner, who would like to combine his professional interest with a hobby, the growing gallery of postage stamps honouring veterinary medicine can be a challenging item. There are currently 20 countries which have issued at least 40 stamps with direct reference to veterinary medicine.

Several countries have issued stamps to honour their humane societies. The first was Cuba; in 1957, it issued a set of two – one regular and the other an air mail – to honour Mrs Jeanette Ryder, founder of the Humane Society of Cuba (1).

1

A set of four stamps (one of which is shown here) was issued in 1962 for the Surinam Organization for Animal Protection (2), and the Vienna Humane Society was honoured with an Austrian stamp in 1966 (3).

2

3

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**P.O. Box 15518, Columbus, Ohio 43215, U.S.A.

The same year, the Humane Treatment of Animals stamp was issued by the United States for the 100th anniversary of the founding of the American Society for the Prevention of Cruelty to Animals. The "official mongrel" shown on the stamp is Babe – whose mother was a Labrador retriever – owned by Norman Todhunter who designed the stamp (4).

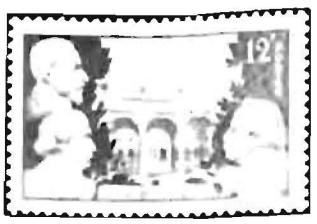
4

There have been other stamps issued for animal protection. The latest addition to the gallery is the outstanding four-stamp set issued last year by Australia for the centenary of the Royal Society for Prevention of Cruelty to Animals (5).

5

France has issued a couple of stamps in honour of the profession. The 1951 issue in honour of veterinary medicine depicts the Veterinary College at Lyons, (the first veterinary school, established in 1762), and professors E. Nocard, H. Bouley and J.B.A. Chauveau (6).

6



Nocard, an eminent bacteriologist, discovered the cause of bovine farcy, an organism later named after him. Bouley, today considered one of the best authorities in the diagnosis and treatment of animal diseases, was Chief of Service at Alfort at age 23, later became Inspector General of all French Animal Husbandry Schools. He was elected to the French Academy of medicine and served as its president. Chauveau, who studied under Bouley, is known for his investigation of heat and energy relations in muscular work, and for his "Retention Theory".‡

France's other stamp for the profession was issued in 1967 for the 200th anniversary of the Alfort Veterinary School. It depicts Gaston Ramon and, if you look closely at the stamp, you will see a statue which is that of Claude Bourgelat (7). Ramon, renowned for his work

7

on immunization against tetanus and diphtheria, was a member of the French Academy of Sciences and Director of the Pasteur Institute. Bourgelat (1712-1779) laid the foundation for veterinary medicine which was then an empiric discipline. He was a prolific writer. His *Medicine des Animaux*, published in 1760, led to his establishment of the Veterinary College at Lyons.

Other veterinarians honoured with stamps include Ignac Josef Pesina, a pioneer in veterinary medicine who was honoured with a stamp issued by Czechoslavakia, and Dr Frenec Hutyra honoured by Hungary as the founder of Hungarian veterinary medicine (8).

8

The veterinarian who became president of his country, Dauda Kairaba Jawara, is shown on the stamps of Gambia. Graduated in Scotland in 1958, he was appointed Principal Veterinary Officer of Gambia, the highest post a native could hold. Then, entering politics, he rose to become President of the country (9).

9

The 125th anniversary of Turkish veterinary medicine was commemorated by a set of two stamps issued in 1967 (10).

10

Veterinary colleges have been honoured on stamps. A 1958 stamp of Denmark commemorates the centenary of the Veterinary and Agricultural School, Copenhagen (11); the 50th anniversary of the Veterinary

11

Medical Faculty at Zagreb was honoured with a stamp of Jugoslavia (12), and Austria so commemorated the

12

‡Chauveau was best known as anatomist. – *Ed.*

200th anniversary of the Veterinary Medical School in Vienna.

Upper Volta issued a stamp in 1970 for its National School of Veterinary Diseases (13), and Mali has issued

13

stamps to publicize the Sotuba Zootechnical Institute (14).

14

Professional gatherings honoured with stamps add several postal miniatures to the gallery. There is the largest "veterinary stamp", issued in 1969 for the first conference of the Arab Veterinary Union at Baghdad (15). Iran issued a stamp in 1967 for the Second Ira-

15

nian Veterinary Congress and another one last year for the 7th ILO Asian Regional Conference at Teheran (16). The 8th Arab Veterinary Congress in Cairo is

16

commemorated with a stamp of Egypt (U.A.R.) issued in 1968 (17).

17

A sizeable number of African countries have issued colourful stamps to publicize the campaign to control Rinderpest. Several of these interesting designs are shown here (18).

18

The gallery of veterinary stamps is fairly large. There are stamps issued by various countries to publicize bet-

ter cattle breeding, and there are various stamps around depicting and publicizing the meat packing industry, canning, tanning and various subjects which relate to different facets of animal life with which the veterinarian is closely allied.

The gallery may be enlarged by inclusion of stamps depicting famous personalities connected with animal studies – Pavlov, Koch, Pasteur – many of whom have appeared somewhere on a stamp.

Diligent study of stamps can turn up many unusual ones related to veterinary profession. For example, one veterinarian, the world famous Jean Marie Camille-Guerin, is only found honoured indirectly. His initial, the "G" is shown on the BCG stamp issued by France in honour of his co-worker, Albert Calmette (19).

19

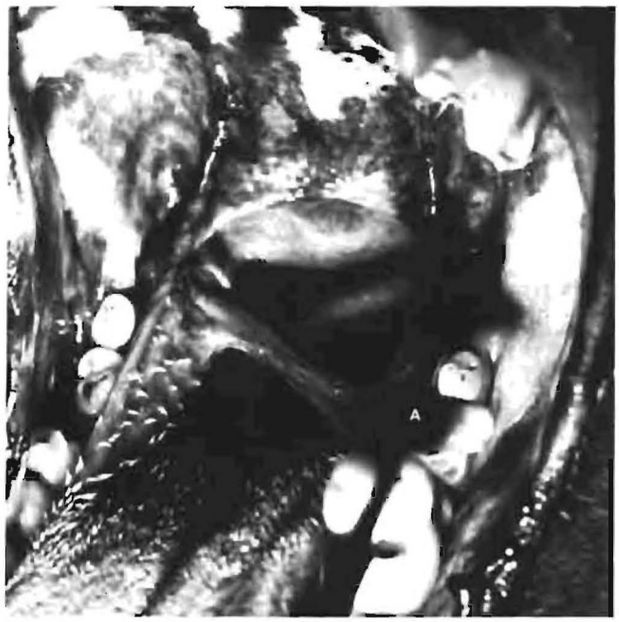
Another related stamp can be that of Iraq, depicting Hammurabi (20). The Code set fees for "doctor(s) of

20

oxen or asses." How were the fees? So-so. An ox or ass cured commanded a sixth of a shekel of silver, but a sheep healed was paid for in kind: a meal of meat was set as the fee.

Readers interested in getting started on a collection of veterinary stamps can best do so by joining the Medical Unit of the American Topical Association, a U.S.-based, 10 000-member international organization of stamp collectors collecting stamps by individual subjects. Further information about the Association may be obtained from the author.

(In South Africa the importance of the livestock industry has been recognised by the regular 1½ c issue in 1961 depicting the head of an Afrikaner ox, the 4 c issue in 1972 portraying a merino sheep and the 15 c stamp figuring a lamb. On September 19, 1972, the centenary of the Society for the Prevention of Cruelty to Animals was commemorated by the special issue of a 5 c stamp bearing the image of a cat. The veterinary profession in South Africa has been singularly reticent about its achievements. Editor).



ECTOPIC TONSIL IN A DOG

A male Doberman aged 10,5 years was referred with a history of chronic vomition and tentative diagnosis of oesophageal obstruction.

The ectopic tonsil was found in the oesophagus making the diagnosis obvious: with each swallowing action the tonsil was swallowed to be vomited up shortly thereafter. Hemitonsillectomy cured the condition.

The fact that the dog only developed the symptoms at an advanced age may be ascribed to the fact that the pedicle must have stretched over the years.

The picture shows the right tonsil (A) at the end of an 80 mm long pedicle.

Submitted by Dr. S.W. Petrick, Department of Surgery, Faculty of Veterinary Science, University of Pretoria

EKTOPIESE MANGEL IN 'N HOND

'n Doberman reun van 10,5 jaar was verwys met 'n geskiedenis van kroniese vomisie en 'n voorlopige diagnose van slukdermobstruksie.

Die ektopiese mangel is in die slukderm gevind en was die diagnose voor die hand liggend: met elke slukbeweging word die mangel ingesluk om dan kort daarna weer uitgebraak te word. 'n Hemitonsillektomie het die toestand genees.

Hoekom die hond eers op die hoë ouderdom die simptome ontwikkel het, kan toegeskryf word aan die feit dat die steel oor die jare moes gerek het.

Die foto toon die regter mangel (A) aan die punt van die steel ongeveer 80 mm lank.

Ingestuur deur: Dr. S.W. Petrick, Department Chirurgie, Fakulteit Veeartsenykunde, Universiteit van Pretoria.

SAVA GOLD MEDAL: SEVENTH AWARD 1978
ERIC MAXWELL ROBINSON

It is fitting that the Gala Dinner celebrating the 75th anniversary of the SAVA, held in the Pretoria City Hall on August 9, 1978, should be the occasion of awarding the Society's Gold Medal to the second oldest veterinarian still living in South Africa, thereby placing the crown on a long and distinguished career.

Eric Maxwell Robinson was born at Market Deeping, Lincoln, England, on October 12, 1891. Events affecting the life of his father, J.A. Robinson (1864–1915), would lead to South Africa also becoming his country of adoption, to the solution's of its animal disease problems he was destined to play a vital rôle. J.A. Robinson was one of ten veterinarians to come to South Africa to assist with the control of the rinderpest epizootic of 1896–1897, and one of two requested to stay on as Government Veterinary Officers in the Cape Colony.

In 1901 Eric joined his parents, who were then staying in Knysna. He attended public schools in Knysna and later in Mossel Bay, where he matriculated in 1907. He attended Rhodes University College from March until September, 1908, then studied at the Royal Veterinary College, London. He became a Member of the Royal College of Veterinary Surgeons in 1912.

After one year in private practice in England, he returned to South Africa to be an assistant to Arnold Theiler at Onderstepoort. In 1920 he was appointed lecturer in Hygiene and Infectious Diseases in the newly established Faculty of Veterinary Science. In keeping with Theiler's wise policy of ensuring adequate training of future faculty teachers, he proceeded to Berne, Switzerland, where he obtained the D. Med. Vet. degree for his thesis on "The Carrier in Bovine Contagious Abortion" in 1921. Teaching in his subject was not to begin until the following year, so he was placed in charge of the Allerton Veterinary Laboratory, Pietermaritzburg; here he commenced serological studies on trypanosomiasis. In 1922 he continued his work at Onderstepoort, teaching being a part-time assignment. (It was to remain so until the beginning of 1958.) In 1925 he succeeded H. H. Green as Professor of Bacteriology: in 1928 the Department became known as the Department of Infectious (Bacterial) Diseases and Bacteriology. He occupied this chair until the end of 1956, when he had reached the university's age limit. He is now the sole surviving member of the original Faculty staff.

In 1929 he obtained the degree of Doctor of Veterinary Science (University of South Africa) for his thesis on "The Bacteria of the *Clostridium botulinum* C & D Types". This was the culmination of several years of work on botulism. The following year he attended the International Veterinary Congress in London. Subsequently he studied at the Pasteur Institute in Paris and at various laboratories in England. He was

awarded Fellowship of the Royal College of Veterinary Surgeons for his thesis on "The Serological Diagnosis of Trypanosomiasis" in that year.

From 1929 he was Officer-in-Charge of the Bacteriology Section of the Research Institute and responsible for bacterial vaccine production. In 1931 he was appointed Sub-Director of the Division of Veterinary Services, became Assistant Director in 1947 and Deputy Director in April 1951. In October 1951 he retired on reaching the age limit but was immediately reemployed as State Veterinarian in temporary capacity. Immediately after his final retirement from State Service on 31st March, 1958, he joined the South African Bureau of Standards as temporary Assistant Technical Officer, where he worked until January, 1960, when he left Pretoria to settle in Knysna, his original home in South Africa. Here, at the age of 69, he established the first private veterinary practice in the area, serving both urban and rural communities. Although his practice continued up to 1977, he was pleased when a younger colleague opened a new practice in town, enabling him

to concentrate on animal welfare: he served as Animal Welfare Inspector from 1970 to 1977.

During his long and distinguished professional career he held the following offices and received the following awards:

President of the South African Biological Society – 1931.

President of Section C of the South African Association for the Advancement of Science – 1932.

Council Member of the SAVMA – 1935.

Editor of the Journal of the SAVMA – 1940 to 1945 and 1951 to 1958.

Recipient of the Senior Captain Scott Medal awarded by the South African Biological Society – 1937.

Elected Honorary Vice-President of the SAVMA – 1948.

President of the Pretoria Rotary Club – 1945.

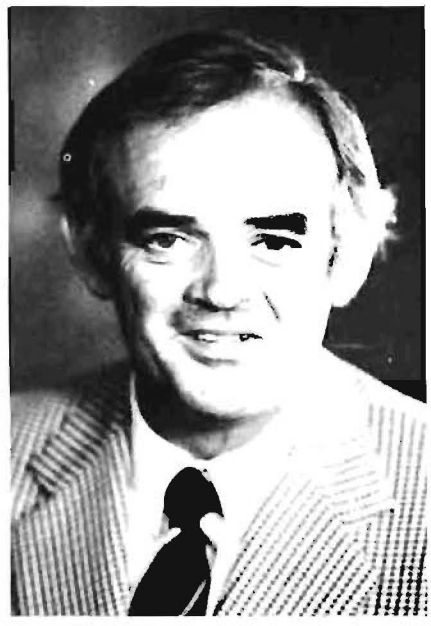
The 71 publications, of most of which he was the sole or senior author, reflect his wide range of interests within the field of infectious diseases and zoonoses. Initially contagious abortion and then botulism figure prominently. His work on the bacteriological aspects of this disease set the seal on a breakthrough for which veterinary science in South Africa will always be remembered. His sense of responsibility to the profession as a whole is indicated by the fact that three of his papers deal with the veterinary profession in this country. No person is more deserving of the award of the Gold Medal of the SAVA than Eric Maxwell Robinson.

THE BOSWELL AWARD

GERARD DUNCAN SUTTON
CLEMENT BRIAN RIPPON

At the Gala Dinner celebrating the 75th anniversary of the South African Veterinary Association, on August 9th 1978, the Boswell Award for distinguished service to the profession was made each to:

DR. G. D. SUTTON



DR. C. B. RIPPON

Gerard Duncan Sutton was born in Wynberg, Cape, on December 14, 1910. After matriculating at the Rondebosch Boys High School in 1927, he worked on a farm in the Aberdeen District for two years, obtained a Diploma in Sheep and Wool at the Grootfontein College of Agriculture in 1930, did another year's stint at farm work, this time in Shropshire, England, and finally took the B.V.Sc. degree at the University of Pretoria in 1936. Then followed the usual year of smear examination at the Allerton Laboratories, Pietermaritzburg, from whence he was transferred to Middelburg, Cape, as Government Veterinary Officer in charge also of animal health at his old College of Agriculture, where, in addition, he lectured in Veterinary Science to Diploma Students.

At the end of September, 1944, he was transferred to the Bacteriology Section of the Veterinary Research Institute, Onderstepoort, where he was responsible for the bottling of vaccines until the end of February, 1962, and did relief work in the Section of Poultry Diseases. He was in charge of experimental animals of the Institute and on the farm Kaalplaas from the end of February, 1955 until the end of January, 1964. The Onderstepoort Abattoir was under his control from 1.2.1964 until 30.8.1968, when he was appointed Public Relations Officer. This position he still holds, despite official retirement at the end of 1975.

From the beginning of 1948 until the end of 1973 he was Senior Lecturer in Animal Management on the Faculty of Veterinary Science. With the assumption of full control of the Faculty by the University of Pretoria on April 1, 1973, he elected to remain in the Division of Veterinary Services but assisted by lecturing until the end of the year, when a successor could be appointed.

He serves on no less than nine different committees of the Bureau of Standards, and also served on three Committees of Investigation, namely one on the use of remounts in the S.A. Defence Force, one on the problems of refuse removal in intensive feed systems, and one on the railing of cattle destined for slaughter. He is a member of the remount purchasing board for the Defence Force (since 1959) and for the S.A. Police (since 1961).

His association with the SAVA has been a long one:

cadet member during his student years from 1933 until 1936 and full member from then onwards. For almost ten years he managed the Book Fund, by means of which the Association made text-books available to students at landed cost, until this activity was ceased. Round about 1950 he took over the Honorary Treasureship of the Association from Dr W.D. Malherbe, and fulfilled this task until the appointment of a full-time Secretary in 1967. The financial aspect of organisation of congresses, however, remained in his hands until the appointment of the present Director. During all these years he attended every congress. He was elected Honorary Treasurer of the Pretoria (now Northern Transvaal) Branch of the SAVA at its inception in 1971, a position he still holds. In recognition of his services to the Association he was elected Honorary Life Vice-President in 1971.

The Association has been fortunate indeed in having amongst its members a true workhorse, a person who has always been willing and ready to tackle any task, no matter how exacting, irksome and unrewarding, and to bear the burden uncomplainingly, year in, year out. The Boswell Award is but a token of appreciation by all members of the Association to Gerard Sutton for his amazing capacity for arduous work devoted to the profession and to the Association.

Clement Brian Rippon was born in Grahamstown in 1938, educated at St Andrews Preparatory School and with a Major Scholarship at St Andrews College, where he matriculated in 1955. After farming for two years he commenced his first year of university study at Cape Town, then proceeded to Onderstepoort, where he qualified at the end of 1962. In his final year of study he was House President. After a few months in private practice at the Sandown Veterinary Hospital he went overseas, became a member of the Royal College of Veterinary Surgeons and saw practice in Matlock, Derbyshire, England from May to August, 1963, and in Lloydminster, Alberta, Canada from September, 1963 until December, 1964. In 1965 he returned to South Africa to establish a rural veterinary practice with combined farming at Proctorsfontein, Grahamstown.

He served on the Executive Committee of the Eastern Cape and Karoo Branch of the SAVA from 1968 until 1972, and again in 1974. He was elected Chairman in 1975, 1976 and 1977, and represented that Branch on the Council of the SAVA during those years. He is a Committee Member of the Rural Practitioners Group and a member of the TB and CA Liaison Committee, a Trustee of the Veterinary Foundation, and has served on the Committee investigating Large Animal Hospitals and on the Committee on Rural Veterinary Services. His organising ability and leadership really came to the fore on the occasion of the Association's Congress in Grahamstown in 1977. The success of that Congress was due mainly to his untiring efforts. He has justly deserved the Boswell Award.

AWARD **TOEKENNING**

ELECTION TO HONORARY LIFE VICE-PRESIDENCY

JAMES LEWIS DORÉ

James Lewis Doré was born at Koffiefontein in the Orange Free State on 25th June, 1913. He attended the Robertson Boys High School from 1920 until 1925 and the Diocesan College, Rondebosch, from 1925 until 1931. For two years, from 1932 to 1933, he studied Industrial Chemistry at the University of Cape Town but then, at the advice of the late Prof. H.O. Mönnig, changed to Veterinary Science. He completed his veterinary studies at the end of 1937.

As was the common pattern in those days, he joined the Division of Veterinary Services of the Department of Agriculture and was sent to the Allerton Laboratories, Pietermaritzburg, to do routine smear examination as part of the extensive East Coast fever eradication scheme, soon to be followed by a month of similar work at Nongoma and at Eshowe. His stint at Eshowe was to last until June, 1939, interrupted only by a five months' participation in the rinderpest campaign in Tanganyika under Major Brassy-Edwards, from May to October, 1938. He was then stationed at Dundee as Government Veterinary Officer, in charge of the districts of Dundee, Newcastle, Utrecht, Helpmekaar and Nqutu, in addition being responsible for smear examination of these areas plus that of Vryheid, Paulpietersburg and Babanango. He resigned from Government Service in November, 1944, and started private practice in Durban, from which he retired in June, 1978. The reputation he enjoyed as private practitioner may be gauged from the fact that from 1964 until 1971 he acted as external examiner in Medicine for the Faculty of Veterinary Science.

A member of the SAVA since qualifying, he was elected Executive Committee Member of the Natal Branch in 1942, a position he held until 1975. In great measure owing to his efforts, this Branch was to become one of the most active and progressive branches, with a spirit of virtually unequalled camaraderie. In recognition of his services, he was elected Honorary Life Member of the Branch in 1976. He also served on the Council of the parent body from 1964 to 1966.

His interest in animal welfare led to his association with the Durban and Coast Society for the prevention of Cruelty to Animals. He is a Life Member and has been President of the Society for many years. A year or two after formation of the South African Federation of Societies for the Prevention of Cruelty to Animals, he joined the organisation and has been Executive Member and Vice-President ever since. He was its representative on the Government Departmental Committee to formulate legislation for the control of animal experimentation. In 1975 he was elected Honorary Life Vice-President of the Federation. Making good use of his standing in both camps, he has done pioneering work in improving the relationship between the veterinary profession and animal welfare organisations. The success that attended the example he has set, led to emulation throughout the country: an atmosphere of aloofness, if not outright antagonism, has changed to one of wholehearted coöperation in an affort to solve mutual problems.

Jim's steadfast pursuit of high ideals in his practice and within the framework of the South African Veterinary Association and animal welfare is justly recognised by his election as Honorary Life Vice-President of the SAVA.

IN MEMORIAM

PROF. DR. H.O. MÖNNIG
1897–1978

Hermann Otto Mönnig, is op 27 Januarie 1897 in Kaapstad gebore. As uitblinkende leerling het hy met studiebeurse aan die Paarlse Gimnasium en die Victoria-Kollege, Stellenbosch, gestudeer waar hy in 1917 die Graad B.A. (Hons.) in dierkunde, fisika en chemie verwerf het.

Met behulp van 'n Koningin Victoria-stipendium studeer hy dierkunde en parasitologie vanaf 1919 in Amsterdam en in 1921 behaal hy 'n doktorsgraad in dierkunde met 'n dissertasie oor parasitologie aan die Universiteit van Zürich. Daarna werk hy 'n tyd lank by prof. Fuhrmann in Neuchâtel aan 'n versameling Suid-Afrikaanse inwendige parasiete.

By sy terugkeer in Suid-Afrika in 1922 word hy as navorsingsbeampte (parasitologie) op Onderstepoort aangestel, skryf op aanbeveling van wyle Sir Arnold Theiler in as student in die veeartsenykunde en behaal in 1926 die graad B.V.Sc. In 1927 sluit hy aan by die SAVV.

In 1928 word hy aangestel as hoof van die Afdeling Parasitiese Siektes op Onderstepoort en in 1929 as professor in parasitologie aan die Fakulteit Veeartsenykunde van die destydse Transvaalse Universiteitskollege (later Universiteit van Pretoria).

Hierop volg baie jare van vrugbare navorsing en doseerwerk en tot 1945 verskyn sowat 58 publikasies oor navorsing in verband met parasitologie en die chemoterapie van parasitiese siektes, afgesien van 'n tagtigtal voorligtingsartikels. Nuwe parasiete by huisdiere en by 'n hele aantal wilde diere van Afrika word deur hom beskryf, en hy maak ook 'n noukeurige studie van die verspreiding van wurms onder skape. In 1934 verskyn die eerste uitgawe van sy boek *Veterinary Helminthology and Entomology*, wat spoedig deur veeartsenyskole in baie lande as standaard teksboek gebruik word. Hy neëm dan ook 'n plek in die voorste ry van die wêreld se parasitoloë in. In 1944 verskyn 'n ander boek uit sy hand, naamlik *Parasiete en Parasitiese Siektes van die Mens*.

Prof. Mönnig was een van die stigterslede van die Fakulteit van Natuurwetenskap en Tegniek van die S.A. Akademie vir Wetenskap en Kuns en het as sekretaris, ondervoorsitter en voorsitter daarvan gedien.

Op vaktaalgebied is hy 'n pionier: die 'Voorlopige Geneeskundige Woordelys' verskyn in 1944 met prof. Mönnig as senior outeur in medewerking met dr F.Z. van der Merwe en mnr J.D. Louw.

In volle fleur van sy loopbaan in 1945 word prof. Mönnig genoodsaak om sy staatsdienspos te bedank, tensy hy gewillig was om sekere beginsels te versaak. Met behulp van geesgenote onder wie talle leidende boere is Agricura Laboratoria gestig, met die doel om middels ter bestryding van dieresiektes en landbouplae te maak en aan die boer te voorsien. Hierdie jong nywerheidswaagstuk het alle rede gehad om te misluk. Desnieteenstaande het prof. Mönnig, as nywerheidspionier op hierdie gebied, die maatskappy uitgebou om nie alleen toonaangewend in Suid-Afrika te word nie, maar ook daarbuite. Hy het hierdie maatskappy tot op byna sewentig jarige ouderdom as Besturende Direkteur gelei en daarna, op aandrang van die personeel wat jare saam met hom die saak gedien het, tot sy afsterwe as Raadgewer aangebly.

Prof. Mönnig was onder andere lid van die W.N.N.R.-raad, lid en Voorsitter van die Nasionale Parkeraad en van die Raad van die Universiteit van Pretoria, lid van die S.A. Akademie vir Wetenskap en Kuns, Nasionale Raad vir Sosiale Navorsing, Adviserende Raad oor Universiteite en American Society of Parasitologists, en genoot van die American Society for the Advancement of Science. Hy was die eerste Wetenskaplike Raadgewer van 'n Eerste Minister en dan ook Voorsitter van die Wetenskaplike Adviesraad. Hy was ook direkteur van onder andere Federale Chemiese Beleggings.

Prof. Mönnig het verskeie onderskeidings behaal, byvoorbeeld:

Senior Kapt. Scott Medalje – S.A. Biologiese Vereniging
Havenga-prys – S.A. Akademie
M.T. Steyn-prys – S.A. Akademie
Bekroning vir Wetenskaplike en Tegniese werke – Geneeskundige Afdeling van die Fakulteit vir Wetenskap en Tegniek van die S.A. Akademie
D.Sc.h.c. – Universiteit van Pretoria
D.Sc.h.c. – Universiteit van O.V.S.

Dit was Prof Mönnig, die uittronende wetenskaplike.

En wat van hom as mens? Vir iemand soos skrywer wat onder hom gestudeer en 28 jaar tot sy dood saam met hom gewerk het, is dit so moeilik en tog ook so maklik om oor hom te praat. Ten alle tye die navolgenswaardige voorbeeld; die voortreflikste leermeester; die kragtige, inspirende en hardwerkende leier; die nimmer-eer-of-statussoekende mens; die nederige, stil en onkreukbare groot man voor wie almal wat saam met hom gewerk het met respek, maar ook met vreugde en trots, klein gevoel het; 'n liefdevolle, aandag- en waardering-uitdelende vader vir almal.

Prof. Mönnig was op die veeartsenykundige en ander terreine 'n reus.

F.J.V.

CONGRESS ANNOUNCEMENT **KONGRESAANKONDIGING**

THE SOUTH AFRICAN NATIONAL AND INTERNATIONAL VETERINARY CONGRESS

DATES

3 September – 8 September 1979

VENUE

Rand Afrikaans University, Johannesburg, Republic of South Africa.

CONGRESS PROGRAMME

The first two days (Part I) of the Congress will be devoted to the official opening, plenary sessions on the latest developments in veterinary science and the Annual General Meeting.

The remaining three days (Part II) will be devoted to parallel sessions of lectures and demonstrations in the following fields:

a. Large animal medicine and surgery
b. Small animal medicine and surgery
c. Poultry diseases
d. Reproduction
e. Wildlife management and disease

PRELIMINARY SCIENTIFIC PROGRAMME

1. Small Animal Medicine

A. Presentations by guest speaker Stephen J. Ettinger, D.V.M., Berkeley Veterinary Medical Group Inc., Fellow, American College of Cardiology; Diplomate, American College of Veterinary Internal Medicine; Clinical Associate Professor of Medicine, School of Veterinary Medicine, University of California, Davis, California U.S.A.
Editor of the textbook 'Veterinary Internal Medicine'.

1. The diagnosis of cardiac diseases including radiological and electrocardiographic technique.
2. Methods of digitalization.
3. The treatment of arrhythmias.
4. The clinical management of asthenia, syncope and seizures.
5. Techniques used in the diagnosis of respiratory diseases.
6. Interpretation of thoracic radiographs.
7. Differential diagnosis and management of coughing.
8. Differential diagnosis and management of dyspnoea.
9. The clinical approach, diagnosis and treatment of acute and chronic diseases of the liver.
10. Ascites – the diagnosis and management thereof.
11. Clinical approach to and treatment of bleeding disorders, including epistaxis.

B. Presentation by Lea Stogdale, B.V.Sc., Department of Medicine, Faculty of Veterinary Science, Onderstepoort.
Addisons disease in the dog.

C. Presentation by Bruce R. Madewell, V.M.D., M.S., Assistant Professor, Department of Oncology, University of California, Davis.

1. Medical oncology – an emerging discipline.
2. Clinicopathologic aspects of skin cancer.
3. Development chemotheraphy for lymphohaematopoietic malignancy.
4. Neoplastic diseases of the skeleton.

D. Presentation by Carrell J. Jucera, Ph.D., Norden Laboratories, Lincoln, Nebraska.

1. The feline leukaemia virus complex.
2. Upper respiratory disease control in cats.

Presentation by D.J. Moore, B.V.Sc., M.Med.Vet., Practitioner, Orange Grove Veterinary Hospital, Johannesburg.
Thrombocytopaenia phenomemon in *Babesia canis* infection.

2. Small Animal Surgery

A. Presentations by guest speaker J.S.A. Spreull, Ph.D., F.R.S.E., Professor of Veterinary Surgery, Royal (Dick) School of Veterinary Studies, Summerhall, Edinburgh.

1. Skin graft in the dog.
2. Surgery of the large intestine.
3. Surgery of perineal hernia.
4. Surgery of the sinuses and nasal cavity.
5. Surgery of the internal ear.

B. Presentation by D.G. Steyn, B.V.Sc., M.Med.Vet., D.V.Sc., Professor of Surgery, Faculty of Veterinary Science, Onderste poort.
Surgery of the Canine Elbow.

3. Large Animal Medicine

A. Presentations by Murray Fowler, D.V.M. Professor and Chairman of Dept. of Vet. Medicine, University of California Davis. Diplomate, American Board of Vet. Toxicologists; Diplomate, American College of Vet. Internal Medicine. 1975 76 Editor-in-chief, 'Zoo and Wild Animal Medicine'.
1. Exhausted horse syndrome (endurance riding)
2. Veterinary management of endurance trail rides.
3. Veterinary problems seen in endurance trail rides.

B. Presentation by Lea Stogdale, B.V.Sc., Dept. of Medicine, Faculty of Vet. Sc., Onderstepoort.
Functional pituitary tumours in horses.

C. Presentation by J.J. Marnewick, B.V.Sc., Dip.Med.Vet., practitioner, Germiston Vet. Hospital.
Calcium homeostasis in the dairy cow – prevention and treatment of hypocalcaemia.

D. Presentation by Carrel J. Jucera, Ph.D. Norden Laboratories, Lincoln, Nebraska.
Control of viral respiratory tract diseases of the bovine and equine.

E. Symposium – Porcine enteric diseases.

F. Symposium on haemotrophic diseases, including *Babesia, Anaplasma, Cowdria* and *Theileria* infections, with invited international speakers sponsored by Wellcome.

4. Large Animal Surgery

A. Presentations by guest speaker William J. Donawick, Dean, School of Veterinary Medicine, New Bolton Centre, University of Pennsylvania.
1. Update on upper respiratory diseases of the horse, differential diagnosis and treatment.
2. Management of skin wounds in the horse.
   (a) Principles of wound healing, cleaning, debridement and closure.
   (b) Principles of reconstruction and free skin grafting.
3. Abdominal surgery in the bovine with special reference to abomasum, caecum and spiral colon.
4. A practical fluid, electrolyte and acid-base therapy in large animals.
5. Genital tract surgery in the male and female bovine and equine.
6. Suture material – does selection matter?
7. Staples in surgery as an alternative to sutures.
8. Advances in the diagnosis and treatment of acute abdomina disease in the equine.
9. General body reactions to trauma in the metabolism of recovery.
10. Surgical repair of large body wall defects in equine and bovines.
11. Recently recognised complications of general anaesthesia in the equine, its signs and treatment.

B. Presentation by S.J.S. van den Berg B.V.Sc., Department of Surgery, Faculty of Vet. Science, Onderstepoort.
External fixation of fractures in large animals.

5. Wild Life Symposium

Guest speaker – Murray Fowler.
1. Capture, care and management of the wild animal.
2. Veterinary management and care of reptiles and amphibians.
3. Protection and conservation of rare South African species.
4. Humane methods of game culling.
5. Fish diseases and their control.
6. General topics.

The above symposium will be followed by a Wildlife Study Tour (approximately 7 days) for which numbers will be limited.

6. Miscellaneous Topics

A. Presentation by J. van Niekerk, B.V.Sc., Dept of Surgery, Faculty of Vet. Sc., Onderstepoort.
Anaesthetic practices in large and small animals at various veterinary faculties.

B. Presentation by G.E. Frost, B.V.Sc., M.Med.Vet., Practitioner, Randburg Vet. Hospital.

C. Noseprint as a means of positive identification in the dog.

D. Dr D. Verwoerd – Pulmonary adenomatosis, a virus disease of sheep.

E. Dr G. Thompson – Swine fever.

F. Dr Morgenthal – A plant intoxication causing a syndrome of prolonged gestation in sheep.

7. Poultry

Presentation by Professor S. Klevin, Georgia State University. Course on advanced laboratory techniques and interpretation in the poultry veterinary laboratory.

8. Pigs

A presentation by Dr Philip Porter, Unilever Research, Colworth Laboratory, Sharnbrook, Bedford, England. Immunology in the pig.

SOCIAL PROGRAMME

Spouses are most welcome; events have been arranged throughout the week. These will include:
(a) Half-day City sightseeing tour.
(b) Half day Soweto tour, including a talk by a well known Witch Doctor in his Sangoma Kraal.
(c) A half-day tour of the Simmer & Jack Gold Mine.
(d) Morning tour of Baragwanath.
(e) Morning tour to the Rand Gold Refinery.
(f) Half-day visit to Onderstepoort.
(g) A full day tour of the City of Pretoria and the Cullinan Diamond Mine.
(h) A full day tour of Pretoria, featuring the South African Bureau of Standards and South African Mint.
(i) Visit to the Higher Safari Ranch, including African tribal dancing.
(j) An open exhibition of various crafts.
(k) A talk by Hugh Tracey – authority on African Music.
(l) A Muslim fashion show.
(m) A talk by Sue Hart on Wild Life.
(n) A talk by Justus Tshungu – a TV personality.
(o) A talk by Rae Graham – the only white witch doctor.

Evening entertainment has been arranged and should provide a fantastic opportunity for all to meet fellow colleagues, both local and from overseas. There will be a welcoming cheese and wine get-together, an oxbraai, a mayoral function and a banquet.

ACCOMMODATION

Accommodation has been arranged by American Express at Johannesburg Southern Sun Hotels to suit all pockets.

TRAVEL

South African Airways has been appointed the official carrier and American Express the official agent. Local group travel arrangements are available from American Express in Johannesburg. Transport to and from the venue has been arranged.

WEATHER

The Congress takes place during Spring when the climate is usually sunny and warm to hot during the day and cooler in the evenings, with the Cape enjoying similar weather. The Natal coast is generally warmer with a subtropical climate.

LANGUAGE

The official Congress language is English.

REGISTRATION FEE

S.A. R110 (U.S. $125.50) Full registration per person, includes social functions.
S.A. R 50 (U.S. $ 57.50). Accompanying wives.

The registration fees have been tailored to suit all pockets. A comprehensive brochure and registration form will be available early in the new year and will be included in the next issue of this Journal (Vol. 50, No. 1; March 1978). As this may reach overseas colleagues too late for return, please reply now and promptly: the basis of acceptance for accommodation, etc., is on a first come first served principle. **A late registration fee will be payable after June 30th, 1979.**

For further enquiries please contact: Dr Issy Bacher
Congress Organiser
P.O. Box 35333
2115 Northcliff
Republic of South Africa.

to whom all applications for registration must also be sent, even if official registration forms are not available. Indicate in which of the following tours you wish to participate.

PRE- AND POST- CONGRESS TOURS

The following pre- and post-Congress tours are being arranged by American Express International, Inc. Prices are inclusive of all meals and are approximate only. With the exception of Tour A, airfares are not included and should be incorporated in your international air ticket.
Items of specific veterinary interest will be included.

Tour A: Kruger National Park
Departures from Johannesburg 31 August 1979 and 8 September 1979.

Day 1
An early morning flight to the Kruger National Park. Game viewing drives by microbus. Overnight at a rest camp.

Day 2
Full day in the Park with game drives.

Day 3
Morning game viewing drive and afternoon departure by air to Johannesburg.

Tour B: Kruger National Park, Swaziland, Zululand and Durban
Departure from Johannesburg 8 September 1979.

Day 1
Departure by luxury motorcoach for the Eastern Transvaal.

Day 2
In the early morning we enter the Kruger National Park for game viewing drives and overnight.

Day 3
Continue by coach to Swaziland and overnight.

Day 4
After a morning visit to the Swazi market in Mbabane, the capital, we continue to Zululand.

Day 5
Today will be spent touring the Hluhluwe Game Reserve.

Day 6
We pass the extensive sugar-cane plantations of Zululand on our way to Umhlanga Rocks, just North of Durban.

Day 7
After morning sightseeing of Durban our tour ends.

Tour C: The Garden Route and the Fairest Cape
Departure from Johannesburg 8 September 1979.

Day 1
Fly to George in early morning. Travel by coach to Plettenberg Bay and overnight.

Day 2
Tour the famous Garden Route, stopping for Lunch at the Wilderness Hotel and continue to Oudtshoorn and overnight.

Day 3
Visit an Ostrich Farm and enjoy a braai lunch. Visit the Cango Caves and overnight at the Holiday Inn.

Day 4
Whole day touring the Garden Route to Cape Town and overnight at Seapoint.

Day 5
Fullday tour to Stellenbosch and a wine farm.

Day 6
Half-day orientation tour to Cape Town. Afternoon at leisure.

Day 7
Tour terminates after breakfast.

Tour D: Kruger National Park, Swaziland, Zululand, Durban, the Garden Route & The Fairest Cape
Departure from Johannesburg 8 September 1979.

This is a fourteen day tour, combining Tour B and Tour C.
Approximate per person costs:

Tour A	(Sharing)	R184	Tour C	(Sharing)	R306
	(Single)	R194		(Single)	R391
Tour B	(Sharing)	R302	Tour D	(Sharing)	R628
	(Single)	R353		(Single)	R773