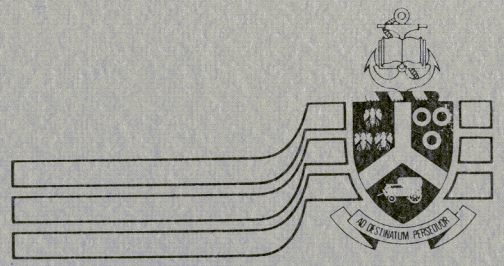

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AFRICAN HORIZONS IN ANIMAL AND WILDLIFE SCIENCES

PROF N H CASEY

UP Drukkery

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Intreerede gelewer op 6 Mei 1993 by die aanvaarding van die Professoraat

VOORSTELLING

Norman Henry Casey is gebore in Queenstown en matrikuleer in die eersteklas aan Selborne College, Oos-Londen. Hy behaal die BSc(Agric)- en MSc(Agric)-graad aan die Universiteit van Natal en in 1982 die DSc(Agric)-graad aan die Universiteit van Pretoria met 'n proefskrif oor die groei en karkassamestelling van Suid-Afrikaanse kleinveerasse.

Sy eerste aanstelling was in die afdeling Fisiologie en Vleiskunde aan die Navorsingsinstituut vir Vee- en Suiwelkunde. Na sy militêre diensplig, waartydens hy die rang van luitenant aan die Suid-Afrikaanse Mediese Korps behaal het, keer hy na die NIVS terug. Kort daarna sluit hy by die Departement Veekunde aan die Universiteit van Pretoria aan as lektor in dierefisiologie. Hy werk as vleiskundige by Karoo Vleisbeurs, maar sluit weer aan by die Universiteit van Pretoria, eers as Senior Lektor in die Departement Veekunde, daarna as Mede-professor en toe volle professor. Op 1 Augustus 1992 volg hy prof Cas Maree op as Hoof van die Departement Veekunde.

Professor Casey het bekendheid verwerf as vleiskundige en sy navorsingsveld is groeifisiologie en veral die effek van groeistimulante op die prestasie en liggaamsamestelling van slagvee. Hy bou dit uit tot fundamentele navorsing in die groeiproses van diere en hy gee daardeur nuwe impetus in die navorsing in dierefisiologie aan die Fakulteit Landbouwetenskappe by hierdie Universiteit.

Hy handel etlike navorsingsprojekte suksesvol af en hy laat talle navorsingspubli-kasies uit sy pen verskyn ter plaatse en ook in die buiteland.

Op uitnodiging besoek hy die VSA etlike male, onder andere die Universiteite van Missouri, Ohio en Wisconsin waar hy uitnodigingsreferate lewer. Hy besoek ook op uitnodiging die Universiteite van Zaragoza en Barcelone in Spanje, sowel as Frankryk, Brasilië en Delhi in Indië.

Professor Casey is die leier van talle navorsingsprojekte, onder andere ook vir 'n Franse organisasie in samewerking met navorsers in die VSA en Frankryk en vir die Waternavorsingskommissie waar hy tans besig is om standaarde vir drinkwater vir plaasvee te bepaal.

Hy dien op wetenskaplike organisasies, onder andere die Suid-Afrikaanse Vereniging vir Veekunde, die Suid-Afrikaanse Raad vir Natuurwetenskaplikes, die Gesamentlike Raad van Natuurwetenskaplike Verenigings en die pas gestigte Suid-Afrikaanse Raad vir Professionele Veekundiges. Hy is lid van The American Meat Science Association, die Suid-Afrikaanse Vereniging vir Voedselwetenskap en

Tegnologie en die Suid-Afrikaanse Vereniging vir Hoër Onderwys.

Professor Casey is die skrywer van 54 wetenskaplike publikasies, meer as 20 populêre wetenskaplike publikasies en 19 navorsingsverslae vir die veenywerheid, sommige waarvan vir die buiteland is. Van sy pen as mede-outeur het pas 'n omvattende handboek oor veeproduksiestelsels verskyn onder die titel "Livestock Production Systems - Principles and Practice" deur C Maree en N H Casey, die eerste werk van hierdie aard wat in Afrika gepubliseer word.

Professor Casey is 'n begaafde dosent en spreker. Hy het groot belangstelling in klassieke musiek en literatuur. Hy is getroud met Annette de Haas, 'n farmaseut van professie en hulle het vier dogters.

Prof P. SMIT
VISEKANSELIER EN REKTOR

AFRICAN HORIZONS IN ANIMAL AND WILDLIFE SCIENCES

Inaugural lecture by
Norman Henry Casey *MSc(Agric), DSc(Agric)*
Department of Livestock Science
Faculty of Agriculture
Presented in the Senate Hall
University of Pretoria
Pretoria, Republic of South Africa
6th May, 1993

Mr Vice-chancellor and Rector, Dean of the Faculty of Agriculture, Ladies and Gentlemen,

The Department of Livestock Science in the Faculty of Agriculture of the University of Pretoria was formed in 1919 with Professor AM Bosman as the first Professor and Head of Department. The department was originally known in Afrikaans as the *Departement Veeteelt*, translated literally the emphasis being on animal breeding. The name was changed in 1964 to *Veekunde (Livestock Science)*, in 1967 to *Veekunde en Dierefisiologie (Livestock Science and Animal Physiology)* and in 1974 to *Diereproduksie (Animal Production)*. Until 1974 livestock science was served by three departments, the one already mentioned and the other *Skaapteelt en Woltegnologie (Sheep Breeding and Wool Technology)* and *Pluimveeteelt (Poultry Breeding)* later *Pluimveekunde (Poultry Science)*, when the three departments were consolidated into the *Department of Animal Production (Department Diereproduksie)*. In 1981 the name again became *Veekunde (Livestock Science)*. The name changes reflect the development that has taken place over the years.

Since 1919 the University of Pretoria has been instrumental in producing the skilled manpower and developing the technology for the animal agricultural industry to establish South Africa as a technological and economic powerhouse in the southern African subcontinent. Agricultural animal scientists emanating from the University of Pretoria also became world renowned.

Traditionally universities are organisations of higher learning and teaching, having inherited their principles of organisation and structure, procedure, ritual and terminology from the medieval age of central Europe, with the institutions of Paris, Bologna and Oxford having had the greatest influence. This inaugural address to be delivered before the *collegium* or *studium* is such a tradition. The *collegium* would upon approval then admit the candidate to the status of professor and, if

the university had been established by a papal bull, introduce the candidate to the bishop who would then confer the *docendi* on the candidate as a recognised teacher of higher learning.

The traditions have been adhered to by the University of Pretoria. Two principles underlie these traditions: The first principle is that the university teacher's philosophical insight, technological competency and character is scrutinised by peers before being admitted to the realm of academic peers. "If universities did not adhere strictly to the main tradition of the academic ethos in the critical assessment of candidates for incorporation into their substantive traditions, they would not have lasted as long as they have "*(Tradition, 1981).*

The second principle is that education, also at the tertiary level, is not only an extension of the prevailing culture, but is also the means of preserving and extending that culture. Language can be the greatest barrier to overcome if free academic association is to prevail between universities. In previous times Latin was the common language; today English. The use of English as the common medium does not detract from own cultural values. What it does do is make the university accessible to a wider field of scholars.

Universities are not traditionally institutions where every subject could or ought to be taught (Chamber's Encyclopedia). Their importance depends on the reputation and efficiency of their teachers, on their numbers and on their capacity to supply what could be supplied by their *studium*. The distinguishing feature of universities as educational institutions is the *jus ubique docendi,* or right to confer degrees. The term faculty, derived from *facultates,* originally meant art or branch of knowledge, but became associated with a group of teachers of a particular subject. The *facultates* developed their own organisation and elected a dean as their chief administrative officer. An interesting ranking existed between faculties of the early universities, those of medicine, theology and law being the 'superior' and the arts being the 'inferior' faculties.

The principal function of the university is teaching, research and teaching through research. As such, the university is a dynamic institution which is constantly exploring new challenges and the changing needs of the society it serves. The academic staff are perpetual scholars and teachers in one. During the post war (World War II, 1939-1945) years the role of universities in creating wealth was realised and stimulated by the Truman administration of the United States of America. The result was the phenomenal technological advances achieved in the USA and the countries under its influence. In his address at the opening ceremony of the University of Pretoria on the 4th February, 1993, Prof P (Flip) Smit, Vice-chancelor and Rector, envisaged that the South African universities had a similar role by developing the intellectual and cultural abilities of the talented young people of this subcontinent.

The University of Pretoria presently has twelve faculties including the Faculty of Agriculture. In the Faculty of Agriculture studies are directed at plants and animals that can be used to the benefit of mankind and at the resources required for supporting these, while applying the principles of eco-management. The task of equipping people with the scientific skills required for developing a career in the livestock industry has been coordinated and dealt with by the Department of Livestock Science.

At this point I wish to utter my *pateras hymnos* and honour those who have preceded me as professor and head of department. Every one of them left an indelible mark on both the academic standards of this university and science in animal agriculture. The university being the dynamic institution already mentioned, rationalisation occurred between departments which were species specific combining these into one Department of Livestock Science. One of the advantages of these mergers was that undergraduate specialisation in animal science was replaced by a more comprehensive career orientated curriculum.

The persons who were *Leaders of the people by their counsels, and by their knowledge of learning met for the people: wise and eloquent in their instructions,* and whom I knew or know and would like to commemorate are Proff JN Bonsma, JS Starke, JC Bonsma, DM Joubert, PHC du Plessis, JFW Grosskopf, GN Louw, JW Nel and C Maree. I cannot forget my mentors Prof WJ Stielau and Dr SW Kock of the Uiversity of Natal and two notable persons in my discipline from whom I gained much, mr RA Hirzel and Dr RT Naudé.

I also wish to mention the many students who have been my inspiration. These are the people for whom the university functions and in whom society is investing a higher education with the expectation of substantial returns. The most rewarding experience a professor has is to see young men and women fresh from high school develop into intelligent young professionals. The most trying, yet spiritually rewarding times I have experienced as a professor have been at the hands (or is it minds) of graduate students.

During the course of 1993, the Centre for Wildlife Management, which includes the Eugene Marais Chair for Wildlife Management, became part of the Department of Livestock Science to form the future Department of Animal and Wildlife Sciences *(Departement Vee- en Wildkunde).* The merger is both timely and correct since the principles of livestock and wildlife management are the same. Also, in research agricultural animal scientists have diversified to wildlife, particularly in the fields of nutrition, physiology and eco-management. The merger between animal science and wildlife management, brings a new dimension to animal agriculture as taught and researched at this university. The academic complement of the Department of Livestock Science is presently nine persons of whom seven are professors.

The merger is also in keeping with the policy of rationalising between departments of common interest.

At this juncture I wish to note in recognition of their contributions to the Centre for Wildlife Management, Prof F C Eloff, founder of the Eugene Marais Chair for Wildlife Management and Dr A Rupert, present Chancellor of the University of Pretoria, who facilitated the grant that established the Chair in Wildlife Management. The Centre was started in 1989 with Proff J du P Bothma and W van Hoven as the permanent academic staff. In the present structure the Centre remains academically autonomous, co-ordinating and conducting research into wildlife management and ecology and graduating students with honours, masters and doctorate degrees in these fields.

The curricula followed in the Department of Animal and Wildlife Sciences are career orientated. It is our endeavour to equip students with knowledge of those processes in the animal body, its physiology, biochemistry and anatomy, and the interacting factors of the environment that would influence the efficiency of animal production and wildlife management, with no species or breed preferences. Knowledge in itself remains sterile if it cannot be interpreted, expanded and applied. If I may quote from the book of proverbs *"If knowledge be the important thing, then get knowledge, but in your getting, get understanding" (Proverbs 4:7).* That is the second objective in our training.

The university in its wisdom has replaced teacher orientated instruction, whereby lectures are virtually dictated, with a student orientated policy of instruction. Students are provided with study guidelines, not notes, and are encouraged to undertake a journey of discovery. This is the foundation for an inquisitive, probing, research orientated mind. Success in this system requires much self discipline and tends to place a heavy workload on the student. The teaching responsibility of the lecturer is by no means reduced. Study guides have to be drawn up carefully and are not a substitute for lectures. Lectures are spent more profitably explaining and discussing the subject at hand and hopefully instilling enthusiasm.

Practical classes are for the practical aspects of animal husbandry. Much of this is done in association with the livestock industry, for example, wool classing, carcass classification and livestock evaluation. In addition students do ration formulating right down to the finest detail in terms of metabolisable energy, amino acids, fatty acids, vitamins and minerals. The computer software for these calculations were obtained from the animal feeds industry. In animal genetics and breeding, students are exposed to the latest computer models which calculate the heritabilities of traits while correcting for a host of influencing factors. In the field of wildlife, field training and research projects could never be done without the support of the wildlife industry, which includes the private commercial sector and

the provincial and national conservation authorities.

Practical classes are indispensable components of our training, but have limited lasting value. To compensate for this due to rapidly changing technology, our training is based on scientific principles.

The aim of our undergraduate training is to unfetter the student's mind, equipped with scientific skills, to be able to adapt to changing technology during the course of a career.

Research is an integral part of university training. As already noted, research is emphasised during the undergraduate curriculum which includes a course in research methodology in the fourth year. Research is the primary medium of instruction in the graduate years, from the honours to the PhD level.

The strong research orientation of this department, the Department of Livestock Science and the Centre for Wildlife Management together, produced 46 refereed papers in scientific journals, proceedings and reference manuals in which academic staff were authors and co-authors, in 1992. The publication prospects for 1993 look equally good. The value of a strong research orientation is that academic personnel are, to use an animal clichè, and one on which we base our *credo,* performance tested. The staff have a high national and international standing of scientific credibility and draw both students and research funding.

In the Department of Livestock Science we regard ourselves as being highly interactive and not confined to the proverbial ivory tower. The high number of research papers mentioned could not have been achieved without the co-operation of many institutions, both from within and without the university. It is dangerous to mention names less some names are accidentally left out, but it is appropriate that due recognition is given to all the other departments in the Faculty of Agriculture and the sister faculties of this university, especially in our case the Faculties of Veterinary Science, Medicine and Natural Sciences, without whom we would be severely restricted. Assistance from the agricultural industry including the parastatal, statal and private institutions is vast. To you too we express our gratitude. Good relationships already exist between this and other similar departments at universities throughout southern Africa.

The dependence of man on animals is as old as the history of man. Animals are interwoven with our many cultures and form central themes in many myths and religious parables and ceremonies. Of all the other living organisms on earth, man's emotional association is the closest with animals. In classical Greek mythology animals are interwoven in the exploits of the gods and heroes. There is the interesting story of Zeus who tried to hide his girlfriend Io from his wife

Hera by turning her into a heifer. But Hera was not deceived and disguising herself as a gadfly tormented Io. Then there was Odysseus, the hero in Homer's Odyssey, who killed cattle belonging to Helos the sun god. In retribution Odysseus's ship was destroyed by a thunderbolt. The god Pan, half man, half goat came to be regarded as the personification of Nature. The role of animals are central to the themes in the Judaean-Christian faith, particularly the sacrificial offering. In African lore and rites wildlife and livestock are also part of the central themes. The Bushmen or San people recorded their closeness with animals in their art, as did the early Europeans at Lascaux. The eland the largest of the antelope, is the most important animal in bushmen mythology appearing in four important rituals: boy's first kill, girls's puberty, marriage and the trance dance. All the animals of the veld had a mythological function. The Khoikhoi and Negroid people's ceremonies, being pastoralists, involved mainly domesticated animals, which has continued to the present era.

Domestication of animals began 10,000 BC with dogs. Evidence indicates that domesticated sheep, goats and cattle were present in the Near East between 7,000 and 6,000 BC. An important change to the African horizon occured about 2,500 BC when people with domesticated livestock began to move southwards. By the first millenium BC, longhorn, shorthorn, humpless and humped cattle were present in Central East Africa. According to archaeological records, cattle were already present in Zambia by 300 BC and sheep were at the Cape 2,000 years ago and from about 500 AD many communities were heavily dependent on livestock. The archaeological evidence comes from sites of the Zhizo, Leopard's Kopje and Mapungubwe in the Limpopo Valley, sites in the Thukela Valley of northern Natal and in the western Transvaal.

At the time of the arrival of the Portuguese in the 16th century, livestock were well established in southern Africa. During the later settlement of the Cape by Europeans and the subsequent expansion into the interior, grazing rights and ownership of livestock became a major point of conflict between the indigenous African tribes and the settlers. The clash, mainly over grazing rights, was unique. In no other area of the world but in pastoralist Africa did the colonising European nations clash with the indigenous people over grazing rights for domestic stock. Here in southern Africa ownership of livestock gave both groups a status which was envied, despised and respected by the other. The Europeans introduced their own livestock which were the envy of the native people and the reason for bartering and cause of pilfering. The Europeans however soon recognised the value of the indigenous livestock and acquired some of the genetic material from the tribes. This formed the nucleus of herds that became famous in the development of southern Africa, for example, the Afrikaner cattle breed and the Boer goat. The Boer goat is today highly regarded as a meat breed throughout the world. During

the past 20 years the Nguni cattle have gained popularity due to their remarkable attributes that made them survivors of the challenging circumstances of Africa.

The African Horizon has changed irreversibly. Gone is the era of unlimited land and grazing rights and large herds of wildlife and domesticated stock roaming the hills and valleys. Gone is the traditional African way of life with its unique culture bound close to the land. Gone are the simple criteria for wealth. Present is a national economy that interacts with a world economy. Present are the mega cities with high population densities and industries, posing awful demands on natural resources and agricultural production. The animal industry, both livestock and wildlife, is fortunately a fairly stable sector of the agricultural industry since it takes the animal industry four to five years to respond to market forces. The resources supporting the animal industry are not as susceptable to immediate circumstantial changes as are those of other sectors of the agricultural industry and changes in demand for animal products are characterised by long cycles. The wildlife industry, being built on the local and international tourist trade, is more susceptable to economic forces.

Present in southern Africa is a new culture, forged and being forged from a multitude of cultural and socio-economic dispositions. Livestock production in southern Africa today straddles a vast cultural difference. Traditional subsistence agriculture and commercial farming enterprises exist side by side. At a first glance it seems as if these categories are on divergent roads, but a closer appraisal reveals the similarities. The large commercial and small-scale livestock producers draw or can draw from the same genetic pool; have to contend with the vagaries of uncontrollable and unpredictable climatic factors; need to provide feed of a minimum nutritive value and in adequate amounts throughout the year; wage a constant battle against parasites and diseases; are subjected to the conditions of the regional and national economy; keep a core of livestock either for production or for their capital value; are forced to convert their livestock or the products into ready cash to finance other commitments; and both should strive for optimum efficiency within the parameters of their cultural and production systems.

Modern livestock strives to deliver marketable products of the desired quality as efficiently as possible. Efficiency criteria are feed conversion, growth rate, age at first calving, intercalving period, duration of the breeding season and length of the calving/lambing season, quantity and quality of milk produced over the lactation period, wool yield and class, egg production, lean tisue growth versus fat tissue growth, carcass yield and productive lifespan.

In today's economically competitive world even the subsistance farmer is under pressure to become specialised in the livestock industry and to use every means

available to improve production efficiency. As opposed to large commercial farms, constraints on the small-scale system are lack of access to basic farming inputs such as stock remedies, mineral and protein supplementation, credit and collateral security. Productivity of small-scale systems is low with average calving rates of 41%, weaning rates of 27%, calf mortality of 24%, herd mortality of 13% and total offtake of only 6%. Small-scale farmers collectively have the potential to contribute significantly to the agricultural sector and national and regional economies, once these constraints have been overcome. To improve productivity of these farmers, animal and health practices should focus on the most limiting factors such as nutrition, calf mortality, disease and internal parasites.

It is in this southern Africa that the Department of Livestock Science of the University of Pretoria will operate, contribute and be an institution of exemplary academic and scientific standing. Attaining this ideal will require dedication and forethought and planning, with an ear to the ground and an eye on the purse. The fruits to pluck are the reputation of our students and the application of our research in industry.

In this respect we are constantly evaluating the position of the department, its strengths, weaknesses, opportunities and threats. In terms of strengths, the department has a strong corporate identity and an acknowledged role in the animal industry of southern Africa and beyond. We are strongly Africa orientated with evidence of this being our involvement in programmes locally and in Kenya, Botswana, Lesotho, Zimbabwe, Zambia, Namibia, Swaziland and other countries; requests for specialist services in animal feeds, breeding and animal products industries; the contract research undertaken.

The academic personnel are highly motivated, proven teachers and scientists and are diversified sufficiently to serve the different disciplines. A high academic standard is maintained by employing a system of external examiners. The rapport between staff and students is good and the students are disciplined, intellectual, highly motivated young people. The supporting staff are excellent all having post matriculation qualifications, many being graduates in animal science or wildlife management. As already mentioned, relationships with the agricultural and wildlife industry are excellent. A symbiosis exists between ourselves and the industry. They serve their vested interests by providing bursaries, research funding and logistical support.

It is said that weaknesses should never be admitted in public, so to save grace, I am ignoring weaknesses and will rather concentrate on the opportunities. The greatest opportunity for growth and development lies in being able to serve through our science, all the people of southern Africa without prejudice and with an

accommodating language policy. The professional and technical services required by the animal industry are not uniform, but distinctly differentiated according to a pyramid structure. In some instances highly trained scientists are required at the top of the pyramid. Descending the pyramid the degree of scientific expertise decreases and that of technical expertise increases. The challenge to all the academic departments training persons for the animal industry, that is the Department of Zoology, Faculty of Veterinary Science and the Department of Livestock Science, is to identify their specific target region. In agriculture we have recently identified the need to produce graduates who are schooled in a specific field of agriculture, agricultural extension and human resource development. The courses are presented in the Post Graduate School for Agriculture and Rural Development. The medium of instruction of the school is English and the whole venture has opened new opportunities for research, training and funding. Therefore, in addition to the existing Bachelor of Science in Agriculture, a more development orientated course will be introduced through which this department will have a direct, positive impact on the development of the technologically underdeveloped rural communities.

The task to teach, do research and provide limited community service is daunting. It is not a weakness to admit that we do not have the manpower and resources to be specialists in every field of animal and wildlife science. From this seemingly precarious position, the opportunity to overcome limitations lies in multiplying our intelligences from external sources. This will be done by head-hunting for the best minds available and appointing these as part-time lecturers and professors (extraordinary), with the right to the title of professor where applicable. An Honorary Professor will be nominated for his or her experience and wisdom. The Honorary Professor's function is to be the academic patron of this department for a period of time. The third opportunity to be exploited is regional co-operation between ourselves and technicons, agricultural colleges and other universities.

The research programmes are directed at improving livestock and wildlife management and production through the disciplines of physiology, nutrition, animal breeding and genetics and the principles of eco-management. Research in physiology concentrates on growth and digestion; in nutrition on dietary requirements; in breeding and genetics on genetic evaluation and applied breeding programmes; in ecology on the interaction between animals and the environment, including plants and water. This latter field is regarded as high priority research in view of the possibilities of wildlife ranching and livestock farming being combined. In both categories, animals are habitat specific and can be kept in combinations to utilise certain spectra of the veld. Advanced computer assisted predictive mathematical models are being used and developed. Combined systems, carefully managed, hold the key to increasing animal production and utilising wildlife effectively, thereby improving the socio-economic situation of the farmers,

including the communal farmers.

If a distinction can be made between applied and fundamental research, 80% of our research is applied and 20% fundamental. The reason is funding is more readily available for applied research. In terms of a university, this is not a sound policy since scientists are at risk of becoming commercial.

Regarding threats, there are two major external threats. The one is funding by the national treasury of universities and of agricultural research through the universities, the Agricultural Research Council, the Department of Agriculture, the Foundation for Research Development and to a limited degree the Council for Scientific Industrial Research. Agriculture is a strategic, primary industry with a major influence on the national economy. Neglecting agriculture is courting disaster.

The other and most ominous external threat is political instability.

Internally there is only one threat. Lost motivation, closeting in the proverbial ivory tower or egocentricity by academic staff can devastate an academic department. The challenge is for every person to rise above personal iodiosyncrasies. In this respect I have the greatest confidence in my colleagues.

Finally, to my colleagues: with your wisdom and skills;
to the industry: with your infrastructure and support;
to our students: with your intellect and dedication,
and by the Grace of God, this Department of Animal and Wildlife Sciences will rise to new heights of academic achievement.

Ladies and gentlemen, I thank you for having honoured me, the Department I represent and the University of Pretoria with your presence here this evening.