

International Features

A Report on a British Cattle Veterinary Association Meeting

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Practical Surgery and Anaesthesia in Ruminants

The National Agricultural Centre, Stoneleigh, England, formed the venue for the November, 1977 joint meeting of the British Cattle Veterinary Association and Sheep Veterinary Society which dealt with the subject of Ruminant Anaesthesia and Surgery. The three-day meeting was attended in all or part by well over a hundred veterinary surgeons and was noteworthy both for the large number of practitioners who presented papers and the many who contributed to the lively discussions which ensued.

Kathie Clarke, Department of Surgery and Obstetrics, Royal Veterinary College, began the proceedings by introducing the subject of "Ruminant Anaesthesia." Besides the problems of the airway, breathing and circulation, which are common to all species when anaesthetised, ruminants produce two extra worries concerned with the rumen and salivation. The rumen produces several effects including the direct pressure on the diaphragm and lungs when recumbent. In lateral recumbency, the upper lung becomes well ventilated, but has little blood circulating through it, whereas the lower lung has a large blood circulation but little air entering it. Tympany also is liable to occur because eructation of gas is prevented by the sphincter being enveloped in fluid. Starvation reduces tympany. A stomach tube can be passed but not always successfully and in lung operations a trocar can be used. Regurgitation can also occur regardless of the depth of anaesthesia and can be either active or passive. If regurgitation does occur, it can cause immediate obstruction and asphyxia, or a rapid "anaphylactictype" of response with pulmonary oedema, or in the long term, pneumonia may occur. Starvation again helps this. If done too long however, the ruminal contents become very fluid. A compromise of withholding food for 24 hours was suggested. Salivation was a nuisance and consisted of two phases, liquid and viscous. Atropine reduced the former but resulted in large quantities of viscous saliva. In a long operation there is loss of sodium and bicarbonate and so the animal becomes acidotic and sodium deficient. On the subject of sedation, chloral hydrate orally or i.v. was as useful as xylazine. This latter sedative still produced some regurgitation but danger can be prevented by the introduction of an endotracheal tube. Phenothiazine derivatives tend to increase regurgitation. Immobilisation had been used by some for sedation but recycling can occur. Ketamine has been used in sheep but it is very expensive. Its use in cattle had recently been reported in America and the dose rate would make it economically feasible.

Mr. Andrew Yoxall, formerly of Cambridge School of Veterinary Medicine, then discussed "General Anaesthesia in Ruminants." He listed the prerequisites for general anaesthesia as a suitable place, anaesthetic, oxygen, apparatus, spanners, insulation tape, endotracheal tubes, drugs and syringes, plenty of assistance, suction, bales and a stomach tube. He showed how it was quite easy to obtain the apparatus necessary for general anaesthesia for about ten pounds (seventeen dollars) by making use of equipment surplus to the requirements of National Health Service Hospitals. He considered a good method to restrain cattle prior to anaesthesia was behind a gate hinged to a wall. The soda-lime canister should be as close to the endotracheal tube as possible. The endotracheal tubes were between 12 and 16 mm for sheep and 18 to 25 mm for cattle. Premedication was of assistance in that it rendered the operation safer to the anaesthetist and patient, it

reduced dose of induction agent, made recovery quicker and reduced secretions. The induction dose was thiopentone 1 gl. per 200 lbs. or methohexitone 0.5 g per 200 lbs. in 50 ml of water. Intubation should be performed as quickly as possible. He preferred assistants to open the mouth for him rather than using a gag. He put his hand into the glottis and put the tube down. If regurgitation was occurring he made the comment that the tube should be put down quickly not mattering whether into the trachea or oesophagus and the cuff inflated. When intubating sheep or calves it was best to have the animal on its back. Anaesthetic was given into the jugular vein of cattle and the cephalic vein in sheep. During the operation, the pulse and respirations should be monitored. Adequate oxygen and anaesthetic supplies (usually halothane) should be available. Suction can be of benefit but if the head is tilted down saliva or regurgitated ruminal contents will be removed. In lactating cattle it is always advisable to give a subcutaneous injection of calcium borogluconate. After the operation the animal should be kept in sternal recumbency with its head on a bale. If the animal does take in ruminal contents, 100% oxygen can be used; in addition large quantities of corticosteroids intravenously and broad spectrum antibiotics are of use. In cardiac arrest, 100% oxygen should be used and the rebreathing bag compressed, the animal should be placed on its side and the heart massaged, up to 4 ml 1 in 100 adrenaline may be used intravenously or 10 ml of 10% calcium chloride.

Mr. Brian Mason, Hitchin, Hertfordshire, then talked about "Experience in the Disbudding of Young Goats" and introduced his subject by a few words on goat husbandry. He commented that they were becoming more popular and the goat could produce 300 gallons of milk in its first lactation. The retail price of milk was about 50% greater than that of cow's and was mainly sold to people with children allergic to cow's milk or through health food shops. The milk had the advantage of being able to be deep frozen without homogenisation but it did not keep over two to three months without separating out. A goat in milk was worth upwards of £60 and kids up to £25. Export animals reached £150 - £200. It appeared that the natural hornless state was associated with hermaphroditism and although the state was dominant it was not encouraged. Goats were dehorned to prevent damage to each other and people. He commented that in large numbers of goats which were disbudded the end result was bad with some horn growth. He considered some of this was because many kids were disbudded too old. If the kid was under one week old when the operation was performed there was little regrowth. He considered it was very inhumane to use local infiltration anaesthesia and made a plea that all goats should be disbudded under general anaesthesia. The use of open circuit halothane or thiopentone and then halothane was useful. Depth of anaesthesia was such that there was no voluntary movement but some reflex movement of the ear and some moaning. If these reflexes were abolished there was prolonged recovery. The horn bud was burnt around in the normal way and once removed the iron was lain flat on the head to cauterise the area.

Mr. Mike Vaughan, Tavistock, Devon, then discussed "A Practitioner's Experience of Ruminant Sedation and Anaesthesia." He said the indications for sedation and anaesthesia were to ensure the patient suffers as little pain and fear as possible and to produce safety for both patient and operator. With enlarged dairy herds most cows are seldom handled around the head and also little or no help is available except the cowman. Xylazine had been a signifi-

cant innovation in this context. It induced sedation, analgesia, relaxation and recumbency depending on dose. Nervous animals require higher dose rates, also there is some breed variation, i.e., Friesians require more than South Devons. He tried to avoid lateral or dorsal recumbency. In his practice general anaesthesia was little used. The main method of anaesthetising was xylazine and 2% lignocaine. Occasionally chloral hydrate i.v. was used. In Caesarean section the animal was given xylazine, paravertebral, and then its legs tied together so that it was in sternal recumbency. In rumenotomy and other laparotomies it was better to keep the animal standing. In painful interventions such as teat surgery and manipulations e.g., teat removal following summer mastitis, xylazine was used. Xylazine was also of use in certain other cases such as sedation in hypomagnesaemia, prolapsed uterus and colic. In calves, pentobarbitone was used for umbilical hernia repairs. However recovery was long and now inhalation anaesthesia is used. In sheep the most common operation was Caesarean section and this is performed under paravertebral. In vasectomy, local anaesthesia and xylazine are preferred. In entropion, correction is performed following sedation with 1 in 4 dilution of xylazine.

Second Day Session: Castration of Ruminants

Mr. John Cox, Department of Veterinary Clinical Studies, Liverpool Veterinary School, introduced the subject with a talk on "Techniques for Castration of Sheep and Cattle." He pointed out that castration was mentioned in the Bible in the book of Leviticus. Castration could be either a conservative or radical operation. Conservative operations included radiation, Bistourage, Tartu, Baiburtcjan, epididymectomy, two bricks, Burdizzo and elastrator. The radical methods included open, closed or covered operations and scrotal amputation. In the conservative methods if a portion of the testicle remains so that the Leydig cells which produce androgens are still present, then the growth rate may well be comparable to that of the entire. It is often claimed that the use of the Burdizzo does not interfere with growth rate as much as open castration. From blood samples taken from calves castrated by this conservative method it was obvious that some still had functional Leydig cells and were producing high levels of testosterone. When teaching students the use of open castration it was emphasised only healthy calves in a clean environment should be done. Fresh straw bedding should be used and the operator must remain clean and should not catch the animal. With calves, they were operated on in the standing position with the head tied by a halter and the stockman restraining the animal. The scrotum is cleaned and the local anaesthetic introduced into the testicle and left for five minutes. The disinfectant used is Povidine antiseptic solution in that the scalpel could be seen and it lost colour when no longer having a disinfectant activity. A vertical incision is made to involve the bottom of the scrotum. Mr. Cox was not in favour of the use of the Burdizzo because it appeared there was more post-operative pain and also there was a significant failure rate due to faulty application. In addition, necrosis of some scrota had occurred even when the operation had been performed correctly. He had also seen one penis amputated with the Burdizzo. One of the reasons for failure was faulty storage of the instrument which should always be stored so that its jaw were open and therefore not under stress. When doing this operation the Burdizzo should be applied to each cord twice and also care must be taken not to entrap too much of the scrotum so that necrosis occurs.

Mr. Nigel Richards, Salisbury, Wiltshire, discussed "Castration in Veterinary Practice." In the practices where he had worked he found the method of castration used was dependent on the tradition of that practice. As the clients were used to the particular techniques undertaken, if a new one was introduced and went wrong then the innovator was in trouble. During the past year he found that probably only ten percent of all the cattle were castrated by the veterinary practice, the majority of farmers were performing the job themselves, particularly with the rubber ring elastrator. About 200 castrations had been undertaken by himself, of these 100 had been performed with surgery and use of the emasculator. The emasculator was used because in that practice deaths had been experienced even in younger cattle using traction. Thirty calves had been castrated by Burdizzo. These belonged to two suckler herds which performed the operation just before they went out to grass and the farmer did not wish to be bothered by the

complications of haemorrhage and sepsis. The remaining 60 or so animals castrated had been larger and normally in the range of 6 to 12 months or were reject bulls. The group between 6 to 12 months was made up partly of those forgotten when younger but the majority were failures following application of the rubber ring. Often there had been no check to see that both testicles were below the ring. Anaesthesia used was local into the testicle and some under the scrotal skin. Seldom was sedation required. In larger Friesians ligation was used because it had been found that the blood of some Friesians did not clot well.

Mr. Brian Kilkenny, Livestock Department, Meat and Livestock Commission, asked the question, "Why Castrate?" He commented that in those areas of the world where castration is practiced, suckler herds tended to be present. In countries such as New Zealand and in Europe where most beef came from intensive feedlots then bulls tended to be used. Few bulls were reared at grass or in semi-intensive systems, although there was no real reason why this should not be done, as in New Zealand 2-2½ year old beef was produced. In cereal beef there was an increase in weight gain of bulls over steers of 11.5%, in 18 month beef the increase was 12%, and roughly similar gains were seen in suckler calves in the suckling and finishing phases. When this is translated into economic terms in the intensive system there is a 57% improvement in gross margin. Gains in 18 month beef were 23%, production of suckler calves 6%, finishing of suckler calves 35% and those producing and finishing suckler calves 10%. He considered the reason why bull beef was not of great importance in Great Britain was because of the artificial constraints placed on the production. These at present include a recommended code of safety which was very expensive to implement. As carcasses, the degree of fatness was less than that of steers, being about 6% less at any weight. The steer has a slightly better conformation particularly in 18 month beef, in that the percentage of total meat from a bull's fore quarter was greater than in a steer, but this was offset by the bull having more saleable meat than the steer. Another problem was the dark colour of bull beef. This was first because there was a decreased fat deposition and resulted in darker meat. The second problem was that of "dark cutting" which was due to low glycogen levels and resulted in the meat not developing the normal low pH. Such meat was still marketable but unsightly and so had to be used in manufacturing processes. The reason for dark cutting was the poor handling of bulls prior to slaughter resulting in depletion of glycogen reserves. Sensible management overcame this problem. When bulls were compared with steers which received various steroid implants, the bulls had a £20 improvement in gross margin over the best treatment group of steers.

Mr. Keith Thomas, Uttoxeter, Staffordshire, talked about "Routine Surgical Procedures in Practice." He began by saying he was celebrating the tenth anniversary to the day of a momentous and catastrophic event of being on a farm and detecting his first case of foot and mouth in a herd of 120 pedigree Friesian cows and followers. Fortunately the agricultural industry had recovered from this catastrophic outbreak of disease and even today in the dairy herd the individual cow was important. Surgery had, however, always been limited by economic consequences. There had been during his time in practice a decrease in traumatic reticulitis, displaced abomasum, septic hocks and teat surgery. This was mainly due to the change from cow sheds to cubicles. He considered any technique used should be carefully thought out and rehearsed in the mind. All thoughts of aseptic technique on farms were impossible and the object was for controlled cleanliness. Speed and simplicity were important. General anaesthesia was not used by Mr. Thomas as he did not think it necessary, in addition because of failures seen at College using the paravertebral anaesthesia technique he always used local anaesthetic infiltration and had not experienced problems with impaired healing. Dehorning of cattle was still performed, but as it was now done on an individual rather than a herd basis, he used embryotomy wire rather than shears. Abdominal surgery routinely performed included rumenotomy, Caesarean section and displaced abomasum replacement. In all cases the same principles applied and the operations were all performed in the standing position without sedation. In all cases a large opening was made to prevent undue stretching of the abdominal muscle layer. In the diagnosis of traumatic reticulitis he

found the Williams' test very reliable and metal detectors were of limited value. He did not often perform the operation if the Williams' test was negative but the detector test positive. He always liked to confirm his diagnosis 2-3 days later before deciding to operate. He reminded the audience when operating for wire always to look for more than one piece of metal. He did not perform operations to correct the displaced abomasum as often as previously, as he found many resolved spontaneously if cattle were forced to walk. Thus the animal was turned out even in winter and made to walk from a distant part of the farm back to the buildings. Concentrates were reduced and replaced by hay. In summer if the condition occurred in an animal at pasture it was often a poor operational risk as adhesions were usually present. Foot surgery and teat surgery were also often performed. His experience was that teat surgery was often a disappointing venture with wound breakdown in 5 to 7 days. In young cattle castration and disbudding were performed and he reminded the disaster which can occur when anaesthetising the cornual nerve if the local anaesthetic is administered intravenously. He considered there was a need for a better designed disbudding iron. In intensively reared calves showing recurrent bloat, permanent ruminal fistulae had been of use. Treatment in heifers of spastic flexor tendons was performed but the owners were always warned not to breed replacements. Recently more cases of intestinal prolapse in the newborn calf had been experienced and he now operated on these by enlargement of the ring and replacement of the intestines.

Mr. Mike Hinton, Department of Veterinary Medicine, Bristol University, discussed "Education for Lay People in Surgical Procedures." He concerned himself mainly with the training of stockmen and this was normally performed at agricultural institutes. These stockmen would be sitting a great variety of examinations from proficiency tests to degrees. Large numbers of the proficiency tests had some veterinary tasks. However, the problem was that veterinary surgeons were little involved in such tests. Many doing the examinations were not veterinary qualified. It seemed the only standard laid down with respect to such tests and welfare was a verbal non-binding agreement. Under this the initial demonstration was performed by a veterinary surgeon, but any subsequent practice was organised by a college lecturer on condition that he had received instruction from a veterinary surgeon. The college lecturers were keen to learn and attended courses run by the Universities. However, the drawback with this was that once the lecturer had attended the course he could then supervise and teach the students, although there is no method to assess the lecturer's proficiency. In addition the students were usually young and so have had little opportunity to gain agricultural experience before training. The reason why proficiency tests exist is that, once passed, the person is entitled to a financial award. Although this is good in theory it is not so in practice, because many workers already received higher wages than the basic rate. Another problem was who assesses the proficiency? Because of the payment for this work most people testing are lay people in the industry or farmers, etc. The Agricultural Training Board tends to make more use of veterinary surgeons than local authorities. The Board also produces training manuals which are written by specialists in training techniques. They come in for much criticism because in many cases only one method of performing a technique is shown when there are often several different methods, all with advantages and disadvantages. Another problem was the unsatisfactory state of the law and in particular the Veterinary Surgeon's Act in that it did not make clear what operation could or could not be done and under what circumstances.

During the afternoon a visit was made to the MAFF, Drayton Experimental Husbandry Farm, Startford-upon-Avon. Here the party was shown around the farm which demonstrated husbandry under heavy Midlands soil conditions. **Mr. Mike Taffs** described a system whereby dairy bred beef steers were being reared on an 18 month system comparing the nutritive quality of barn dried hay and silage cut at varying times. Both hay and silage gave similar results and when grass was cut at a digestibility of 70 in the first week of June cattle gained in the winter 1 kg per day. Delaying cutting by 10 days reduced the D value and the steers gained 0.84 kg/day. A further delay of 10 days in cutting produced forage only capable of 0.75 kg/day gain. The barn dried day was in the form of

rectangular large bales and would be baled at a moisture content of 35%. This reduced the time of hay being at risk from five to three days. The bales are dried or conditioned in tunnels constructed in arches of big bales. The tunnels are built of 4 to 5 arches, and each arch consists of 11 big bales. The moisture extraction unit is by blowing without heat other than that from the engine. The sheep flock was described by **Ms. Barbara Maund** in which there was an effort to increase production. It could be done by increased stocking rates or increasing output per ewe. At Drayton the latter approach was being tried. By recording, the flock had been built up of Halfbred Fin x Scottish Halfbred, Cambridge x Scottish Halfbred, and pure Cambridge ewes. The number of lambs born per ewe was over two in all but the Scottish halfbred. The lamb mortality had risen to 21.8%. About 25% of this mortality was either mummified or dead before birth and 5% died at or around birth. Those dying after birth included 29% starved or chilled, 7% weak lambs, 13% trauma, 8% enteritis infections, 5% non-infectious conditions and accidents and 6% no diagnosis. Mortality was higher in multiple births and lambs of lower birthweight. An increase in lamb birth weight had been shown to reduce mortality. **Mr. Mike Hedges**, Deputy Farm Director, described the calf rearing programme. Four batches of about 60 calves were bought annually at an age of 4-14 days old. After arrival in the afternoon they were not fed until the following day. Once-a-day milk substitute feeding of 3/4 lb. of milk powder in 4 pints of water was used. Concentrates and hay were fed *ad libitum*. Weaning was when 750 gm concentrates were eaten for three successive days. At 8 weeks old they were moved to follow-on accommodation. Different ventilation systems were used from natural to controlled environment 28 to 100 cu. ft./calf/minute. The calves had 250 cu. ft./calf in the controlled environment to 400 cu. ft./calf in the natural ventilation. The temperature was regulated to a minimum of 40°F. All calves received vaccination against *S. dublin*. A recent trial had examined the use of vaccination against respiratory disease viruses. This had not shown any difference between those vaccinated and the non-vaccinated controls. A study was in progress to compare the beef potential of Friesian and Holstein calves.

During the evening **Mr. Gwyn Beynon** (Former President of the RCVS) talked on the subject "Animal Mutilations—Are They Justified?" In introducing the subject he noted the unusual amount of interest which had been focused on it but regretted that the veterinary profession had not expressed its attitude to it. He accepted that it is a very emotional subject and therefore tends to be left aside by veterinarians. This point was also emphasised by **Mr. Snodgrass** in his paper on this subject at the Congress in Swansea. During the last century the profession took an active interest in the welfare of animals and through its support the "Cruelty to Animals Act" came on the Statute Book. He pointed out that the Royal College of Veterinary Surgeons had studied this subject and discussions were taking place with the B.V.A. and the Ministry of Agriculture and he hoped that the profession would be made aware of the R.C.V.S. working party conclusions as soon as these preliminary discussions had been completed. He went on to discuss the regulations which now exist in relation to animal welfare and described in some detail the individual mutilations which were practised at the present time. He finally appealed to the veterinary profession to make known its concern and attitude about the various mutilations which were taking place. He emphasised that "Only until we speak as one voice can we hope to succeed in preventing unnecessary mutilations from taking place."

Third Day Session: Cattle Ovum Transplantation

Mr. Andrew Yoxall and **Mr. Chris Davies** (Elanco Products Ltd., Basingstoke) were the speakers. **Mr. Yoxall** pointed out that although an operation which had generated much interest of late, ovum transplants were first performed about ninety years ago. He said one major problem was to have the donor and recipient synchronised so that they were about \pm 1 hour of each other in the cycle. This required either a large recipient herd of about 200 to 300 cattle or the use of oestrous synchronisation techniques such as prostaglandin. **Mr. Davies** then took up the theme by describing the method whereby it was possible to synchronise the donor and recipient and also superovulate the donor. If possible the donor should be 1 hour earlier in the oestrous cycle than the recipient.

Eggs were removed at the 6 day stage. Animals were starved the night before and water was deprived on the operation day. A mid-line laparotomy technique was used on the donor, the incision being just anterior to the udder. The uterus was exteriorised and tied to a bar. The ova was flushed out from the oviduct and the uterus using tissue culture medium. The washings were collected in a glass bowl and the eggs collected using a dissection microscope. It was essential there was no haemorrhage or this tended to mask the eggs. It was considered best only to use a donor twice before allowing her to breed naturally again. The donors were anaesthetised with thiopentone whereas the recipients had methohexitone. The uterine horn on the same side as the corpus luteum was exteriorised and the egg inserted from a pipette through a small stab incision. The conception rate to begin with in Mr. Davies' team was 20-30% but increased to about 75% at the end. His experience with non-surgical techniques had been a poor recovery of eggs. He considered the reasons for failure and why his own team no longer functioned were because there appeared to be a breed variation in superovulatory response, degeneration of ova or recovery taking place at the wrong time, failure of implantation and early embryonic death in the recipients, stress and cash. Mr. Yoxall had experience with a Jersey herd where the aim was to produce a Friesian herd. Here good breeding donors were to be used but in practice only cows of poor fertility status or heifers of unknown fertility tended to be offered for the project. It also appeared that the Friesian cattle did not superovulate with the hormonal regime used. The life of the ova tended to be quite short—not much more than four hours.

Professor David Noakes, Department of Surgery and Obstetrics, Royal Veterinary College, then described "Parturition Normal and Abnormal." He began by trying to estimate the cost of dystocia to the country. In an Exeter survey 2.0 to 2.5% of all cows were culled for calving injury. However, this was really the tip of the iceberg and 35% were culled due to reproductive disturbances. Stillbirth in cows was also five times as common in dystocia as in normal births. In Australia pre-natal death in Dorset Horn sheep reached 36% and virtually all was due to dystocia. In Australia a study of oestrous detection and subsequent conception showed both these were 15% lower in those which had previously suffered dystocia to those with normal parturition. The process of parturition could be divided into five stages, i.e., preparatory stage, three stages of labour and the return to normal uterine size. The onset of the parturition process was somewhat complex and was an interaction between the fetus and the mother. The maturation of the fetal hypothalamus allowed it to respond to stress factors or to be subjected to stress factors. This ultimately influences corticosteroid production which in turn depresses progesterone production and oestrogen increased on the fetal side of the placenta. Prostaglandin levels rise causing lysis of the corpus luteum, softening the cervix and affect the myometrium ultimately resulting in myometrial contractions. The first stage of labour is dependent on development at maturation of postural and righting reflexes, fetal movements and uterine contractions. Prolongation of the second stage of labour can be argued to be dystocia. In sheep 70% have lambed within two hours of onset of uneasiness and 72% lambed within one hour of onset of straining. Professor Noakes then gave the average and range of times for each stage of labour in cattle and sheep. Dystocia could be categorised as maternal or fetal. In sheep the majority of dystocia in some surveys conducted by farmers was high but appeared to be low in those undertaken by veterinary surgeons. Direction of head and neck and flexion of limbs each accounted for about a third of all cases of dystocia. In the cow fetal oversize or maternal undersize was the most common cause of dystocia. This could be due to delay in the maturation of reflexes, sluggish fetal metabolism, absent or weak uterine contractions, poor uterine tone, fetal abnormalities. In sheep stocking rate influences dystocia but the age of the ewe after two years old had little effect. Breed and birthweight of the lambs were also important. In cattle the older the cow the less calving difficulties were experienced, the size of the animal also had an influence.

Mr. Mike Vaughan talked about "Caesarean Section in Cattle." Between 30 and 50 were performed a year and most were due to fetal oversize. The clients in the practice had been used to having Caesareans performed for a long time and most had not

tried to calve the cow. Most of the cases were in the South Devon breed. The herds were mainly suckler herds and it was therefore important to have a live calf for the cow to rear. The length of gestation was important and as the calf gained weight fast at the end of gestation induction of heifers beyond 290 days duration was recommended. His technique for Caesarean section included xylazine, paravertebral and epidural anaesthesia. He liked to shave the site. He preferred the animal to be in recumbency and normally the operation took about 40 minutes. He preferred to exteriorise the uterus. On removal of the calf it was placed next to the mother and blood was milked into the calf. The calf was placed on clean straw and it was considered important to remove as much fluid as possible from the lungs. The calf was also injected with antibiotic and the navel sprayed. Both cow and calf were checked in 24 to 48 hours. The sutures were removed after 10 days undoing the lower sutures first.

Mr. Jim Hindson, Hatherleigh, Devon, then described "Caesarean Section in the Ewe." The indications for Caesarean section included non-dilation of the cervix which accounted for about 25% of all dystocia and a higher percentage of those on which Caesarean section performed. Other causes for surgery included oversize, fetal deformity, pregnancy toxemia, torsion of the uterus, a small pelvis, malpresentation and posterior presentation. Oversize could be assessed by a formula based on the ratio of the diameter of the internal ischial arch to the digital diameter at the fetlock which was then modified by the parity of the animal, and whether or not the fetus was in posterior position and of a large breed. A ratio of less and 2.3 indicated surgery and if less than 2.1 Caesarean was essential. Cases of pregnancy toxemia were not found often to result in live ewes but lambs would be salvaged. Torsion in sheep normally involved the body of the uterus. A contraindication to Caesarean was when dead lambs were present. The technique of operation used an adaptation of a slaughtering cradle. The sheep was sedated with acetyl promazine and paravertebral anaesthesia used. The wool was clipped, never plucked, as it produced pain and more stress in the animal. Economics of sheep at present were that a ewe was worth at least £20-£25 and a ewe with two lambs was worth £50-£60. Provided the operation was successful and the lambs were alive and allowing for the 75% recovery, the operation was worth £10 to £15. The discussion of the two papers was opened by **Mr. Alan Hopkins** (Tiverton, Devon). He stressed it was necessary to accurately locate the uterine incision. If the uterus was torn there were post-operative adhesions. Cleansing was very important and it was vital to prevent premature separation of the umbilical cord. Speed was not important but a good result was. Ringwomb in sheep was often associated with multiple births. An impacted breech presentation of the calf has in his experience sometimes been associated with spontaneous uterine rupture.

Dr. Peter Bedford, Department of Surgery and Obstetrics, Royal Veterinary College, then changed the subject completely by discussing "New Forest Disease" or more correctly, infectious bovine kerato-conjunctivitis (IBKC). This was the commonest ocular disease of cattle and was well recorded in the 19th Century. Incubation was 1 to 5 days and the first clinical manifestation was a faint patch of opacity. This rapidly intensified and by 3 to 4 days there was a central patch of corneal opacity. If the eye was stained with fluorescein drops there was staining. The superficial epithelium eroded and this resulted in acute trigeminal pain which caused lacrymation, photophobia and blepharospasm. The discharge soon became mucopurulent. A halo of neo-vascularisation became apparent at the corneo-scleral junction. It should be remembered that IBKC could heal spontaneously. In 6-7 days there was a central opaque spot with corneal oedema and the limbal vessels migrate towards the opening. At the tenth day there was a mass of capillary loops and if corticosteroids were used they might relieve the pain but reduce the neo-vascularisation. By the sixteenth day the critical phase of healing was occurring. If the stroma of the cornea or its deep layers was included there was some degree of rupture. Staphylooma formation might occur and if infection entered the eye a panophthalmitis might occur. The aetiology was complex and bacteria isolated included *Moraxella bovis*, *Neisseria ovis*, *E. coli*, staphylococci, streptococci, diphtheroids, and *Pasteurella multocida*, mycoplasma, rickettsia-like

organisms, psitticosis lymphogranuloma trachoma organisms, viruses and thelazias have also been found. Predisposing cases included ultraviolet light, dust and insects. Treatment could be by means of topical ointment such as chloramphenicol. However, it should be remembered that ointment only remains in the ocular area for about 60 minutes and drops for about 20 to 30 minutes. The sub-conjunctival depot approach was used successfully by many practitioners but the reason for its success was debatable. The possibility of using the systemic approach was suggested, particularly the use of sulphonamides.

Professor Leslie Vaughan and Barrie Edwards, Department of Surgery and Obstetrics, Royal Veterinary College, then provided a demonstration under farm conditions in the NAC Beef Unit. They demonstrated the use of the mobile Hannover trolley whereby it was possible to rotate an animal from the standing to the lateral position. The use of intravenous regional anaesthesia of the bovine feet was shown. Following application of a tourniquet at the foot, injection into the lateral metatarsal vein was performed and produced anaesthesia of the foot. By applying pressure at the carpus an injection into the radial vein produced anaesthesia of the front foot. After anaesthesia the application of a wooden shoe to a foot was shown as can be successfully used to treat fractured pedal bones. Following their demonstrations at the beef unit both Professor Vaughan and Mr. Edwards gave lectures on lameness in cattle. Professor Vaughan concentrated his attention on the stifle joint. He described upward fixation of the patella and stated it was mentioned in many of the old text books where it was called dislocation of the patella. In fact it was not really a dislocation but a hooking of the medial patella ligament over the femoral trochlear and so it was a physiological fault. It was particularly seen in thin cattle, hence its reference in old text books and also to it being common in Asia. The condition is mostly towards the end of gestation and often the animal has shown a stringhalt-type action prior to fixation. Sectioning the medial straight patella ligament corrects the condition. It can be done in the standing position using xylazine. Another condition resulting in rigidity of the hindleg with hock extended and stifle flexed was spastic paresis. Lateral dislocation of the patella was another condition of cattle. Although it had been seen in a few adult cattle it was more commonly diagnosed in calves as a congenital problem. The patella slips and dislocates laterally so no weight can be taken. When examining the patella can be felt to be lateral. The condition is operable but such cattle should not be used for breeding. Internal derangement of the structures in the stifle joint can occur. The structures involved are the cruciate ligaments, the menisci and the meniscal ligaments.

Lameness is of sudden onset in the adult and is particularly common in bulls. It occurs following rotation of the stifle when bearing weight on the limb and can occur in bulls following service. In a few days there is complete destruction of the joint so that when examined post mortem it is usually impossible to know what structures were involved first. The condition is often hard to diagnose but flexing of the stifle produces crepitus but often hard to locate the site. The use of local anaesthetic into the joint can be helpful as the lameness will show some improvement. In addition the tibia can be pushed forward when the animal is cast. Peroneal paralysis is often the consequence of recumbency, particularly in milk fever. It is the result of pressure on the peroneal nerve at the level of the fibula head.

Mr. Barrie Edwards then dealt with foot lameness. There was often infection of the interdigital cleft, wall of hoof or in the sole. Once infection was in the foot what was important was to know the structures involved. The area of the navicular bursa, joint capsule and insertion of the deep flexor tendon was very important. If infection reaches one it is liable to affect them all. The condition of the middle area of the foot was important, namely ulceration of the sole (medial aspect) and separation of the white line (lateral aspect). Sole ulceration is very common in the West of Britain and was very painful. It began as direct or indirect trauma of the sensitive laminae and later resulted in ulceration. When the horn is removed exudate is revealed and granulation tissue. All underrun horn should be incised and granulation tissue removed. If the lesion is not treated then the navicular bursa and flexor tendon may be involved. About 50 percent of cases occur in the first two months after housing. White line separation involves the lateral aspect of the foot and was a separation of the wall of the hoof. There is then a triangular space for infection to gain access. Treatment is to incise underrun horn. Often the condition is a herd problem, and is often seen in wet conditions. Husbandry and feeding are important. Often laminitis in cattle is not taken sufficient note of, chronic or sub-acute laminitis occurs and can be seen in some animals as several layers of horn. Hoof deformities can be of an inherited nature, particularly disparity in size of the claws. A crossed claw may be seen and this is associated with increased vascularity in the claw. This results in discomfort and in many cases considerable pain.

And so with feet firmly on the ground again the conference on practical ruminant surgery and anaesthesia came to a close.

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The Richard-Götze Clinic for Cattle Diseases, Hannover Veterinary School

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(English translation by Mrs. Laverne Jones, Oklahoma State University Library and Prof. Dr. Stöber.)

Introduction

The present Clinic for Diseases of Cattle was organized in 1953 as one of three scientific-didactic and administrative units from the Clinic for Obstetrics and Cattle Diseases founded in 1925/26 by Prof. Dr. Dr. h.c. Richard Götze, and which he so excellently directed for almost three decades. Through its consequent practice-related orientation to the most important species of domestic animal, i.e., the bovine, it initiated the orientation of other Hannover veterinary clinics towards "species-specialization." (Today there is a special clinic for each animal species—horses, cattle, pigs and small animal

ruminants, dogs and cats, poultry, fish.) The mission of the "Cattle Clinic" embraces, with the exception of the diseases of the sexual organs and the udder, all diseases of the domestic ruminant, namely: sporadic organic diseases, infectious diseases, parasitoses, metabolic disturbances, deficiency diseases, poisonings, malformations and hereditary diseases. Since it became independent, the Clinic for Diseases of Cattle has been under the guidance of Prof. Dr. Dr. h.c.mult. Gustav Rosenberger for 25 years. For a more thorough discussion of this era it should be borne in mind that there is further historical data on the Clinic for Diseases of Cattle in the commemorative