ASSOCIATION OF VETERINARY ANAESTHETISTS

ABSTRACTS

Spring Meeting-1994

Veterinary Faculty, Zaragoza
-Spain-
ASSOCIATION OF VETERINARY ANAESTHETISTS

Veterinary Faculty, Zaragoza-Spain.

PROGRAM

Wed, 27 20.00 h. Reception of Delegates at the Paraninfo (Plaza Paraiso, 1) of the University of Zaragoza by the Rector of the University.

Thu, 28 (Lecture room)
9.00-9.30 Registration of Delegates (Reg. desk at the Main Hall)
9.30-9.45 Presentation of the Meeting. Dr. J.I.Cruz
9.45-10.30 HISTORY OF SPANISH VETERINARY ANAESTHESIA IN THE XIX Cent.
Dr. T. Higuera. Facultad de Veterinaria, Zaragoza (Spain).
10.30-10.45 Influence of carprofen on halothane minimum alveolar concentrations (MAC) in the dog by H.I.K. Alibhai and K.W. Clarke. RVC. London (UK)
10.45-11.00 Anaesthetic management partial cranieotomy in fifteen dogs
AHT. Newmarket (UK)
11.00-11.30 C O F F E E B R E A K Comercial exhibition
11.30-11.45 Nalbuphine as post-operative analgesic in dogs: a comparison with buprenorphine by L. Hellebrekers, Radboud M.F.J. Kemme and Ron W. van Wandelen. Faculty of Veterinary Medicine. Utrecht (Netherlands)
11.45-12.00 Propofol anaesthesia in dogs by E. Komar and J. Lipp.
Faculty of Veterinary Medicine. Lublin (Poland) and Animal Practice in Bayreuth (Germany)
12.00-12.15 The Komesaroff small animal anaesthetic machine by D. Komesaroff.
Royal Melbourne Hospital. Melbourne (Australia)
12.15-12.30 The use of Metaraminol bitartrate to Blockade the hypotension produced by the levomepromazine HCL in dogs by N. Nunes, L.G. Pompermayer, J. Pirolo and S.C. Rahal. University of Sao Paulo (Brasil)
12.30-12.45 Comparison of the total intravenous anesthesia induced by medetomidine-butorphanol-midazolam or medetomidine-buprenorphine-midazolam and study of their reversibility by atipamezole in beagle dogs by B. Pypendop, D.
Serteyn and J. Verstegen. Faculté de Médecine Vétérinaire. Liège (Belgium)
12.45-13.00 Laboratory studies of clinical signs of inhalation anesthesia in dogs by E.P. Steffey and T.B. Farver. School of Veterinary Medicine. Davis.
California (USA)
13.00-13.30 Comercial exhibition Video Tapes
14.00-16.00  L U N C H  (Restaurante "LATRE", 5 min walking from the Faculty)

16.00-16.45 ACUPUNCTURE AND PAIN IN HUMAN PATIENTS
Dr. J.A. Vecino. Hospital Cruz Roja. Zaragoza (Spain)

16.45-17.00 Acupuncture techniques in small animal practice by  J.I. Cruz, P. Pien
J.A. Vecino. Facultad de Veterinaria. Zaragoza (Spain)

17.00-17.15 Pharmacokinetic relationship between the bioavailability of ACP and the
dose after single oral administration in dogs and cats by  J. Verstegen,
J. Deleforge, K. Oncin, L.D.M. Silva and D. Rossillon. Faculté de
Médecine Vétérinaire of Liége and Biopharma Simon S.A of Bierges
(Belgium); Vetoquinol laboratories Lure (France)

17.15-17.30 Minimum infusion rates (MIR) for Ketamine and Thiopentone in the cat by
A.L. Webb. College of Veterinary Medicine. Florida (USA)

17.30-18.00  T E A  B R E A K  Commercial exhibition. Video Tapes

18.00-21.00  C I T Y  T O U R  (free to all Delegates & Accompanying persons)

21.30-23.00  W E L C O M E  C O K T A I L  (Hotel Meliá-Corona)

Fri, 29 (Lecture room)

9.00-9.45 PAIN AFTER SURGERY IT IS GETTING BETTER
Dr. J.Stevens. London (UK)

9.45-10.00 Anaesthesia in horses by continuos infusion of tiletamine-zolazepam:
preliminary results by  J. Ezquerra, R. Medina, J.M. Uson, R. Delgado and
J. Jimenez. Facultad de Veterinaria. Cáceres (Spain)

10.00-10.15 The influence of clenbuterol in anaesthetised ponies on the intramuscular
microcirculation and other cardiopulmonary parameters by  Y.H. Lee, K.W.
Klarke and H.I.K. Alibhai. RVC. London (UK)

10.15-10.30 Quantification of lameness pain by accelerometric measurements by
U. Schatzmann, M.A. Weishaupt and R. Straub. University of Berne
(Switzerland)

10.30-10.45 Isoflurane and opioid or alpha-2 adrenergic drug interaction in horses by
E.P. Steffey and P.J. Pascoe. School of Veterinary Medicine. Davis.
California (USA)

10.45-11.00 General anaesthesia in field equine practice by  C. Scicluna  Clinique des
Grosbois. Boissy Saint Leger (France)

11.00-11.30  C O F F E E  B R E A K  Commercial exhibition

11.30-11.45 The use of the alpha 400 (Minerve,France) to ventilate horses under
general anaesthesia by  C. Scicluna  Clinique des Grosbois. Boissy Saint
Leger (France)

11.45-12.00 Induction of anaesthesia in the horses with alphaxalone by  A.L. Webb,
College of Veterinary Medicine. Florida (USA)
12.00-12.15 The binding of ketamine to serum albumin of humans and several animal species by G. Fernández, J.M. Lumbreras, G.Fernandez, J.M. Gonzalo Orden Facultad de Veterinaria. León (Spain)

12.15-12.30 Endocrine response to lactate infusion during pentobarbitone anaesthesia by S.P. Luna and P.M. Taylor. AHT. Newmarket (UK)


13.00-13.30 Comercial exhibition. Video Tapes

14.00-16.00 L U N C H (Restaurante "LATRE" 5 min walking from the Faculty)

16.00-16.45 ANAESTHESIA IN THE PIG AS AN EXPERIMENTAL ANIMAL

Dr. I Alvarez. Hospital La Paz Madrid (Spain)

16.45-17.00 Body temperature affects the dexmedetomidine induced macchances in anaesthetised mini-swine by O.Vainio. Farmos Group, Turku (Finland)

17.00-17.15 Cardiorespiratory effects of acepromazine, xilacine and midazolam under different MAC concentration of isoflurane in the dog by I. Alvarez, F. Tendillo, A. Mascías and M. Santos. Facultad de Veterinaria. Madrid (Spain)

17.15-17.30 Monitoring of partial pressure of CO2 in arterial blood during diagnostic laparoscopy in previously hypercapnic pigs A. Mascías, F. Tendillo, I. Alvarez, and M. Santos. Facultad de Veterinaria. Madrid (Spain)

17.30-18.00 T E A B R E A K Comercial exhibition. Video Tapes

18.00-18.15 Influence of I/E ratio in controled ventilation on the cardiovasular system by I. Alvarez, F. Tendillo, A. Mascías and M. Santos. Facultad de Veterinaria. Madrid (Spain)

18.15-18.30 Pilot study and clinical observations on the use of propofol by intraosseus route in pigeons by J.López, J.I. Cruz, O. Burzaco, R. Pascual and M.V. Falceto. Facultad de Veterinaria. Zaragoza (Spain)

20.30 Buses collect Delegates & Accompanying persons to CONFERENCE DINNER

Sat. 30 (Lecture room)

9.00-9.45 Annual General Meeting

9.45-10.30

Dr. E.P. Steffey. School of Veterinary Medicine. Davis. California (USA)

10.30-10.45 Inmovilization of wild spanish cantabrian chamois (Rupicabra rupicabra parva) in the north of Spain by J.Fernández, F.Ballesteros, P.Quiros and J. Benito. Parque Zoológico de Barcelona; Biogestión. Burgos (Spain)

11.00-11.30 COFFEE BREAK Comercial exhibition


11.45-12.00 Use of propofol as an inductor in the gas anaesthesia in sheeps by P. Cordero. Hospital Militar Central "Gómez Ulla" Madrid (Spain)

12.00-12.15 Ionic blood composition in adult carp (Cyprinus carpio) anaesthetised with 2-phenoxy-ethanol by A. Josa, E. Espinosa, J. Esteban, J.M.Caballero. Facultad de Veterinaria. Zaragoza (Spain)
HISTORY OF XIX CENTURY VETERINARY ANAESTHESIA IN SPAIN

TERESA HIGUERA CAVERO, Licenciada en Veterinaria.  
MIGUEL ANGEL VIVES VALLES, Profesor Titular Numerario de  
Patología Animal (Cirugía) de la Universidad de Extremadura.  
ANTONIO LEUZA CATALAN, profesor titular Numerario de Patología  
Animal (Cirugía) de la Universidad de Zaragoza.

Preventing pain in operations, according to Velpeau, "is a chimera  
in surgical medicine, as a sharp instrument and pain are words which go  
hand in hand, and whose association one has to admit." This chimera is as  
old as the art of curing and has been one of humanity's constant searches  
since the olden days. Its discovery only dates back to the last century,  
time when the surgical technique was revolutionized by three great  
discoveries: haemosthasia, antisepsis and anaesthesia.

Our concern about investigating the latter and the discovery that  
until now and according to our data, the history of anaesthesia has not  
been correctly studied in Spain, is what has motivated us not only to  
carry out our minor thesis degree but to continue being interested in  
discovering the origins in our country of the evolution of a technique,  
which is considered today as essential for the surgeon.

Not making do with the references to the advances in human  
medicine, nor the evolution of veterinary anaesthesia abroad, our aim was  
to find out the facts about veterinary anaesthesia in Spain, to thus be  
able to have a direct knowledge of a part of our professional history which  
is unique, individual and unrepeatable.

Thus after studying anaesthesia in general and collecting data from  
bibliographical analysis, we have developed a historical review based on  
the XIX century, which reflects a reliable overview of what has happened,  
which respect to veterinary anaesthesia, in our country.

By this method we hope to achieve two objectives: on the one hand to  
be able to thoroughly examine a time when the arrival in Spain of the  
discovery of anaesthesia, was publicised and received with a mixture of  
excepticism and hope and, on the other, to be able to answer the  
following questions: How did the knowledge of anaesthesia start in our  
country? Who was the first Spanish veterinarian to make use of it? What  
was the degree of use of anaesthesia by the XIX century veterinarians?  
How much information did they have?
Bibliographic review

As an introduction to the history of anaesthesia we will refer to the data already known and published in historical works on veterinary anaesthesia, based generally on the history of anaesthesia in medicine, which inform us the main events abroad, especially in the United States and England, such as those of Smithcors, Soma, Spinks, Lumb-Jones and Weaver.

Thus we will go to briefly describe the events which took place outside our country, as follows:

The discovery of prehistoric human remains with precision trepanations already insinuated the possibility of some kind of dulling of the senses, perhaps a blow with a mace on the head, or a blow on the chin or on the solar plexus as suggested by Smithcors. Written references show that different cultures have developed varying attempts to prevent pain throughout history.

Thus, the Assyrians strangled the children to suffocation before circumcising them, the Greeks placed pressure on the carotid to make them dopy, the Chinese used hashish and acupuncture. In the Iliiad, Homer refers to a "bitter plant which kills the pain"; Ovid describes the specific nature of opium; Pliny comments on the calming effects of hemlock; Dioscorides writes about opium and belenium and Celsius mentions the poppy, lettuce and mandragora among others as apparent sleep-producers.

Other methods were perhaps alcohol, as almost all the civilizations have known the secret of fermentation and cold temperatures, suggested by Severino of Naples, which was not used until the Second World War.

During the Middle Ages the "sleeping sponge" was used as a favourite anaesthesia. This was made by soaking a sponge in extracts of opium, hemlock, belenium, lettuce, etc., holding it over the patient's nose.

The Renaissance produced very little with respect to anaesthesia end it seems that a mistrust arose towards the drugs, and other methods were sought to eliminate pain; thus, the famous surgeon Paré again used the method of carotid pressure, exercised by the ancient Greeks, to produce the anaesthesia.
From the XVI century to the first half of the XIX century, different investigations took place, which would give rise to great advances in the History of Anaesthesia, such as the production and identification of ether by Paracelso, the endovenous use of opium by Elsholz, Wren and Boyle, the discovery of carbon dioxide by Helmont, of oxygen and nitrous oxide by Priestley, of chloroform by Guthrie, Liebig and Soubeiran and of chloral by Liebig. Experiments were also carried out, whose findings were, unfortunately, not reported until years later, such as the description of the anaesthetic effect of nitrous oxide by Davi, the demonstration of the properties of ether as an anaesthetic and its reversibility by Brodie and the performance of surgical operations, submitting the animals to carbon dioxide, by Hickman.

However, the scientific world did no echo these discoveries and thus, History shows us that, after a lucky discovery, its disclosure was delayed by three centuries in the case of ether, half a century for nitrous oxide and somewhat less for chloroform.

If the men of Medicine and Veterinary Science had kept more up to date with History and been more eager to verify previous works, the History of Anaesthesia and Surgery would have been different; however the most widespread opinion is that for many years surgeons have only trusted in a quick technique and strong assistants; we only have to mention the anecdote commented by Spinks when he refers to the fact that Syme's (a famous English surgeon) record for a mid-thigh amputation, without anaesthesia, was alleged to be nine seconds, including the patient's left testicle and the forefinger of the chief assistant.

It seems that the lack of communication and the scepticism towards anaesthetic advances marked this time. Thus Clarc and Long produced anaesthesias with ether on human beings, but this was not published; at the same time Wells seeing that during the so called "laughing gas parties" caused by nitrous oxide, people fell to the floor and did no hurt themselves, carried out tooth extractions in secret using this gas. Latter on, Wells was one of the first to try to make his discovery public at the Howard Medical School, but the patient, who was a student, started to shout out as if it hurt him and he failend in his demonstration.
At this time, a chemist called Jackson advised Morton, a Boston dentist, to use ether as an anaesthesia and he used it to extract teeth. The Historic milestone of anaesthesia was being profiled and one would have to wait until October 16 1846, the date when Morton administered ether to Gilbert Abbot leaving him unconscious for the surgeon John Collins Warren to extirpate a tumour on his neck; the operation was performed successfully and at the end of it Warren said: "Gentlemen, this is no farse".

This date, from our viewpoint and that of many others, is undoubtedly the common starting point for the dissemination of information to all the clinicians in the world.

In a setting of dispute to be the first to claim the discovery between Clark, Long, Jackson and Morton, the discovery of a technique, which not only prevented the patient's pain, but gave the surgeon precious time and comfort, was quickly publized and two months after Morton's demostration, Robert Liston amputated a leg under anaesthesia by ether at the University College in London.

That same year, Fluorens reports the result of his experiments with animals under chloroform, which did not take long prevailing over ether when performing operations. Chloroform, quicker in induction, less irritating and volatile than ether, is soon adopted by the doctors, and Simpson, based on a series of 50 operations, declares that the properties of chloroform are superior to those of ether.

The experiments with ether and chloroform multiplied; articles are published about different experiments, and different instruments are developed for inhaling the gases.

Almost at the same time, Crawford and Pirogoff invent rectal anaesthesia with ether, although according to Smithcorts, this technique had been ignored for many years.

After the invention of the hypodermic needle by Rynd it became possible to carry out endovenous anaesthesia using choral hydrate.
Focusing on veterinary anaesthesia, and according to foreign historic reviews, it seems that **George H. Dadd** was the first veterinarian to use ether or chloroform in surgical operations in America. **Dadd** lived at the time when anaesthesia by ether had been demonstrated and it was perhaps his concern for his patients which led him to use this to a greater extent than other surgeons. **Dadd** was the first veterinarian who, in his works "The Modern Horse Doctor" 1852 and "Cesarean operations on sows" 1858, appeals for a humanitarian treatment and for the application of scientific principles in veterinary medicine. Robert Jennings also coincides with Dadd and indicates the use of anaesthetic agents to make the animal insensible to pain.

However, some years had to elapse before the **Cruelty to animals Act** was passed, which restricted the use of animals for experiments to people with degrees and who had special permission. And even longer before the requisite for animals to be anaesthetized before being submitted to a surgical operation. This is also reflected by the lack of interest in anaesthesia shown in professional veterinary documents during the last quarter of the XIX century.

We can give as an example, the paper mentioned by **Lumb** and **Jones**, which was presented by **Jewell** in 1900 to obtain his Doctor's degree in Veterinary Science by the University of Cornell where an ovariotomy is described end which says: "Immobilizing small animals is simple. Stretch the animals out on a sloping surface, with the side were the incision is to be made facing upwards, the mouth must be previously bound if it as a dog or cat. The legs must be tied with small ropes and be completely extended, an assistant must hold the animal firmly".

After the brief description of the advances of anaesthesia in the world, we wish to present you with the history of veterinary anaesthesia in Spain during the XIX century.
We have searched for information in our country, with the aid of our essential manuals, the *Historia de la Veterinaria Española* by Sanz Egaña, the *Compendio de la Bibliografía de la Veterinaria Española* by Morcillo Olalla and above all the *Bibliografía Hispánica de Veterinaria y Equitación* by Palau Claveras. With the help of these works and taking the first scientific and public demonstration, made by Morton of the possibilities of anaesthesia as a starting point, we have focused our search on the veterinary texts published in our country from 1846 onwards, in order to thus collect the first statements made by Spanish professionals who, after discovering these advances, tried to put them into practice.

In our survey, our main interest has lain in the five decades from 1846, with the aim of observing the degree of information and the interest in putting scientific knowledge into practice.

Our search is based, firstly, on the only periodical publications of that time: the *Boletín de Veterinaria* and *El Eco de la Veterinaria*, and secondly, on all books which deal with some sort of clinical aspect, especially Medicine, Surgery, Therapeutics, Pathology, Medical Matters, etc... as well as Veterinary Manuals, Dictionaries and Formularies.

After studying the bibliographic collections of the veterinary faculties and making a survey of the private libraries of veterinary professionals and booklovers who have kindly opened up their collections to research we can clear up the unknovws set forth at the beginning of this paper.

*(How did veterinary anaesthesia begin in Spain?)*

With respect to the start of veterinary anaesthesia in Spain we can say that on 16 October 1846, Morton administered ether to Gilbert Abbot, in the United States, two months later Robert Liston carried out the first major operation with anaesthesia in Europe, and three months later, Diego Argumosa, professor of the Faculty of Medicine of San Carlos and considered as the first Spaniard to use anaesthesia for surgical purposes, publishes "Way to dull pain during surgical operations by inhaling sulphuic ether".
In our profession, the echo of the extraordinary advance in anaesthesia does not take long in being picked up and circulated throughout the professional world by means of the specific media represented by El Boletín de Veterinaria, and thus, on April 15 1847 just six months after Jackson, Morton and Warren consolidate the Historical Milestone of Anaesthesia, and article is published in our country titled: "Insensibility in animals by breathing in sulphuric ether," signed by Nicolás Casas where mention is made of the fact that this has also been used on animals as an anaesthetic agent to perform painful surgical operations, its mode of administration and effects.

Almost one year later, the discovery of chloroform made by Soubeiran many years before is published and a description is given of the advantages of this substance, compared with ether, only five months after Simpson made his experiences known.

However with this articles, where Casas does not mention his source of information, there are also papers about more or less new or risk operations on animals such as cataract operations or enterotomies which make no mention whatsoever of anaesthesia.

It seems that unfortunately and unlike what is happening in Human Medicine, Veterinary Anaesthesia is quickly applied as anti-spasmodic or anticonvulsive therapeutics, or as a means of immobilizing the animal, more than as an auxiliary and essential means for surgery, as can be seen by the constant appearance of articles on the treatment of tetanus, abdominal vertigo, strychnine poisoning, etc.

Not until 20 September 1856 do we find a description for the first time of a strictly surgical application; in a case of strangulated inguinal hernia, after unsuccessfully attempting to reduce it with the animal awake, chloroform is used to directly obtain sufficient relaxation to overcome the resistance of the muscular walls.
(Who carries out the first tests and what is obtained?)

The second question set forth leads us to investigate into the author of the first tests and the achievements obtained.

According to the literature consulted, we believe without doubt that the first test described about the anaesthetic procedure was carried out on March 11, 1848 at five o'clock in the afternoon at the Veterinary School of Madrid, by Ramón Llorente y Lázaro, Professor of Special Pathology and Therapeutics, with chloroform prepared by Manuel Rios, Professor of Organic Chemistry of the Faculty of Medicine, administered on an equine which, once anaesthetized by applying a damp cloth to the nostrils, is subject to different painful operations such as the application of the fire rays and more or less deep incisions. Later on the animal’s recovery as well as the state of the mucosa, the respiratory rhythm and the pulse are described.

We consider this key test to be a milestone in our anaesthesia due to two aspects: firstly it was the first reliable test as the anesthesia being feasible, obtaining immobility and insensitivity and the not less important demonstration, of the reversibility of the process. Secondly, and always according to Nicolás Casas’ notes, this experiment was even more well-known, as it was carried out the presence of professors, military veterinarians professionals and students.

Finally the conclusion is reached that anesthesia will provide the veterinary professors with great advantages based due to the animals' insensitivity and also the laxitude of the tissue.

However, these thoughts will not take shape for many years due to different obstacles which the veterinarians of the second half of the XIX century found, such as resistance to an innovation, bad techniques, accidents and economic problems.
(Use of anaesthesia by the XIX century veterinarians)

After locating the origin of the use and circulation of the veterinary anaesthesia in Spain, we will go on to describe the use of this technique by XIX century veterinarians as well as their degree information.

It can be taken from the data obtained from the bibliographic study that XIX century veterinarians used ether and chloroform more for therapeutic purposes than as an aid in surgery. Thus the different papers published in the professional magazines of that time, mention cases of tetanus, abdominal vertigo, pneumonias, strychnine poisoning or cholics cured by anaesthetic agents, whilst in other articles, operations such as esophagotomies, enterotomies or the ablation of tumours are mentioned without a word about any sort of anaesthesia.

Ether and chloroform were commonly used in frictions, embrocations, enemas or potions together with other substances such as the poppy or opium; but they were also used in inhalations, which, according to Casas is the only way it was used as an anaesthetic agent. For this latter purpose, simple systems were normally used by way of permeable inhalants made with burlaps or cloths soaked in anaesthetics and applied to the nostrils.

In general the anaesthetics were used as a last resort, perhaps due to lack of knowledge of the technique, perhaps due to economic factors, perhaps due to the fear of an accident and above all due to the reticence of the practical clinicians, still in force today, when faced with changes in their normal working habits.

In spite of all of this, papers began to gradually appear where, although with therapeutic purposes, the use of anaesthetics and the effects produced are described, even commenting on the state and recovery of the animal. In addition, apart from these articles, Treaties and Compendia are written such as those of Darder, Martínez de Anguiano, Téllez Vicen, Alcolea y Fernandez and others which include topics about the origin, characteristics and properties of anaesthetics.
In spite of the fact that the magazines reported the discovery and success of anaesthesia, the clinicians rarely used it, and if they did, always after trying all the normal methods, without offering any security for the animal's owner and often after managing to cure the animal, they doubted whether the good result obtained could be a result of the anaesthetics.

Perhaps it was the fear of accidents derived from the use of the anaesthesia, which slowed down its use, accidents which, on the one hand, were logical, as substances considered today as toxic were used and on the other hand because the anaesthetic was introduced all in one go, without assessing the state of the animal until it was anaesthetized. Although little by little different authors advise moderation as indicated by the article signed by Anginiard, were after treating a case of tetanus by inhaling chloroform, he comments that he lacked positive data about the dosis, doubting whether he would have achieved it earlier if the amount had been increased, and ends up saying that the danger of the use of chloroform is proportional to the concentration of the vapours, it being advisable to being with moderate dosis.

The clinical world responded these accidents on opposite ways: some totally refused to use these agents and others carried out studies to control this new technique.

Thus Darder in his Veterinary Surgery, advises being guided by the state and phenomena of the animal's eye, the colour of the blood, breathing and pulse. He also provides data about the times, duration of the effects and amount of anaesthetic used.

Another point which may have rise to quite a few accidents is the generalization of its use without controlling the animal's state or the illness and Morcillo Olalla points out: "the use of inhalations of ether and chloroform is not advisable in all the cases of tetanus because in some cases it gives rise to violent and disorderly muscular contractions and to irregular and tumultuous movements of the heart which I have been able to observe at times".

Also, Rodríguez y García when commenting on the use of chloral tracheal injections say that chloral is extremely useful if used when the disease starts but inefficient later on.
The presence of accidents is corroborated also by the fact that Sainz y Rozas in his Toxicologia General Veterinaria talk to the prognosis, anatomical alterations and medication in the case of intoxication by anaesthetic asphyxiating poisons.

Alcolea y Fernandez write an interesting article in 1889 commenting on the fear that the use of anaesthetics inspires in patients, doctors and veterinarians, and explain a series of points about accidents due to respiratory failure. They comment on Langlois and Richet's experiments on the paralyzing action of the respiratory muscles, caused by the anaesthetics, and also talk to the possibility of reverting the respiratory depression by means of artificial respiration with or without tracheotomy. At the same time, they relate the alteration in the nervous centres, responsible for the respiratory movements, with the amount of anaesthetic supplied.

The cause of these accidents, apart from improper administration could have been the form in which the anaesthetic substances were obtained, thus Téllez Vicen warns that chloroform bought in the shops is often impure and that it must not be used in therapeutics because it makes the typical action of unstable chloroform and gives it special properties, making it more dangerous.

It is easy to imagine that the veterinarian was apprehensive about using anaesthetics above all in surgery, where together with the risk of the operation itself, one had to add the danger of an unfortunate anaesthesia. However, sometimes, the absence of an anaesthesia was the cause of other accidents such as the compulsory enucleation which Téllez Vicen had to practice when, due to a sudden movement, the aqueous humor came out when operating on a dog for cataracts.

To these dangers, one must add a reason which, although not at all scientific, has unfortunately marked all advances in science. This is the economic reason, thus in the documents signed by Téllez Vicen and Giles they warn about the excessive price of chloroform and Darder refers to the fact that veterinarians generally use ether because it is more economical than chloroform. It is also important to comment that in the fees, anaesthesia is not contemplated as a professional activity which must be paid for, but it seems that it only forms part of a treatment.
All these fears and difficulties were sufficient obstacles for the clinicians to continue using a speedy technique with muscular assistants to carry out the surgical operations. Many years will have to go before the veterinarian realises that well-controlled anaesthesia provides him with precious time and essential relaxation conditions for a correct surgical technique, apart from preventing our patients from suffering.

Unfortunately, however, the hold ups faced with the introduction of innovations, which last until our days, is made patent in the XIX century documents. Thus we have news of operations such as the ocular enucleation carried out by Salvatierra, or the enterotomy carried out on a horse by Marshal Pascual Martinez, or like the bloody description of the exostosectomy carried out by Carballo del Carpio in the branch of a mule’s jawbone, operation where an attempt was made to chloroform but which was not done so as not waste time, the operation lasted for three hours, and it was not finished completely because the mule must have been fatigued and they were exhausted, due to the fact that the positions were uncomfortable and violent.

This stand still can also be seen in books such as the Tratado Completo de Cirugía Veterinaria by Brognièz where different and complicated operations are described without mentioning anaesthesia or the Formulario del Veterinario Práctico by Cagny, in the XX century, where when speaking of the general anaesthesia he says that in veterinary science it is not necessary, except in exceptional cases. Cadeac, also, when speaking extensively about anaesthesia, does not mention it as a basic activity for surgery. García Izcarra does not say anything either about the events of anaesthesia in our country and points out that is not used very much due mainly to three problems: the need for an assistant, the lack of concern about the animal’s pain and the anaesthetic expense.

Perhaps Dardeí, in his Cirugía Veterinaria, may have discovered another of the causes of the veterinarian’s lack of enthusiasm about the use of anaesthesia, mainly for clinicias with few anatomical studies, for whom the abolition of sensibility was a problem because it denied the surgeon of one of the great means of diagnosis, as the wounds of the nervous branches or of the more or less sensible parts went unnoticed for him.
In spite of this reality, which respect to the practice of anaesthesia, we have been able to verify that in general the veterinary profession was well informed or that at least it had information sources such as periodical publications on hand, although these magazines were more professional than scientific.

The greatest communicators of specialized scientific news both from abroad and from our country were professors from the Veterinary Schools such as Nicolás Casas, Jerónimo Darder, Alcolea y Fernandez, etc., and they also produced textbooks used in veterinary studies of that time.

In general we can say that our country coincides with the evolution of anaesthesia in other countries: firstly news is had of the discovery and this quick spread, then it began to be used without any scientific base causing accidents which will give rise, on the one hand, to the banishment of this technique, and on the other hand, to the research and consolidation of some standards of use. Later on the treaties and formularies appear which will describe this technique in depth until, after almost one century, the surgeon realises the scope of the discovery of anaesthesia which together with antisepsis and haemostasia revolutionize the surgical technique.

Today, in 1994, anaesthesia is fortunately not only conceived as compulsory training but as a blessed need in any surgical act.