

TherIOGEnOLOgy: FROM CONCEPT TO ACTUALITY

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The American College of Theriogenologists (ACT) has been an actuality since its recognition at the AVMA's 108th Annual Meeting in Detroit, Michigan in July of 1971.

Already, time is limited for firsthand recording of the ACT's difficulties and struggles from its conception through parturition and for review of the objectives of the ACT's organizers. Already, sufficient time has passed to permit a preliminary appraisal as to whether the ACT is worthy of survival through continually rejustifying its existence.

In the USA, the roots from which theriogenology has evolved may be found in the classic texts of Prof. W. L. Williams of Cornell University. In 1909, Williams published Veterinary Obstetrics; Including the Diseases of Breeding Animals and the New-Born. During the subsequent three decades, Williams published several editions of both Veterinary Obstetrics and a companion volume, Diseases of the Genital Organs of Domestic Animals.

During the 1940's and 1950's, following decline of the equine population and reflecting increasing bovine interests, a few veterinary researchers were occupied with infectious diseases affecting reproduction; predominantly, brucellosis, with trichomoniasis and vibriosis as minor considerations. A very few outstanding veterinary clinicians - university faculty or practitioners - were concerned with problems of infertility in the bovine and equine. Research projects (and most available funds) for advancing the revolutionary techniques for artificial insemination of dairy cattle, and for study of contingent problems, were in laboratories of a dominant group of

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Presented at the Annual Fall Conference of The Society for Theriogenology, September 26-28, 1984, Denver, Colorado. This is the first lecture in a series of annual lectures to be given by recipients of the David E. Bartlett Lecture Award. This award was established by The American College of Theriogenologists and the Society for Theriogenology to recognize distinguished theriogenologists.

well-trained, competent, animal physiologists who were both highly productive and effective.

Until the founding of the Rocky Mountain Society for the Study of Breeding Soundness in Bulls, veterinary interests in reproduction must be recalled as characterized by lack of organization. In Colorado, in 1954, in consequence of their common, local challenges and experiences, a small group of veterinarians founded that pioneering organization. Their limited objectives were to share and disseminate the essentials for evaluation of beef bulls for "fertility" and to standardize procedures employed. In retrospect, it is now evident that this little organization provided the cohesive force for something that was ready to be born.

In 1966, the Rocky Mountain Society for the Study of Breeding Soundness in Bulls changed its name to the American Veterinary Society for the Study of Breeding Soundness. Membership had expanded numerically and geographically. Scope was to include the bovine female.

In the mid 1960's, the AVMA began encouraging the formation and recognition of specialty groups to be identified as Boards or Colleges. The AVMA's Advisory Board on Veterinary Specialties was established with responsibility to guide and monitor developing organizations.

In response, diligent efforts to gain recognition as a specialty group by committees of the American Veterinary Society for Study of Breeding Soundness extended over several years. They failed to persuade the AVMA's Advisory Board on Veterinary Specialties of the existence of a definable fund of accumulated knowledge and expertise in "reproduction" which was of sufficient magnitude to be worthy of recognition and standing alone. There was question as to the teaching capabilities available within the university systems. Also, this Board seemed not to have been satisfied that the essentials for achieving a sound new specialty organization were extant.

In the spring of 1970, upon initiative of Dr. Lloyd Faulkner, a fresh start was undertaken. A new Organizing Committee consisted of:

Professor Raimunds Zemjanis  
Veterinary Clinic, School of Veterinary Medicine,  
University of Minnesota  
Professor Stephen J. Roberts  
Department of Large Animal Medicine, Obstetrics and  
Surgery, New York State Veterinary College, Cornell  
University

Professor Fayne Oberst  
Large Animal Clinic, College of Veterinary Medicine,  
Michigan State University

Professor John Kendrick  
Department of Reproduction, Veterinary Clinic,  
University of California

Professor Lloyd C. Faulkner  
Animal Reproduction Laboratory, Colorado State  
University

Dr. David E. Bartlett  
Vice President Production and Veterinarian, American  
Breeders Service, DeForest, Wisconsin  
- as spokesman for the Committee

Drafts of constitutions of a proposed "American Veterinary Board of Animal Reproduction" and an "American Veterinary College of Animal Reproduction", that had originated in the American Veterinary Society for the Study of Breeding Soundness, were modified and revised to coordinate with perceived policies of the AVMA's Advisory Board on Veterinary Specialties.

An appearance before the Board on Veterinary Specialties by representatives of the Organizing Committee in March of 1970 was both revealing and shattering. Those of us most involved were quite unaware that the obvious to us, that "reproduction" was a distinct and rapidly growing field in veterinary medicine, was not universally so regarded nor appreciated. While dismaying at the time, in retrospect, it is now evident that the differing points of view expressed within the Board should not have been so shocking.

At that time, customs for presentation of "reproduction subjects" did vary widely among the various colleges of veterinary medicine in the USA. For the equine and bovine, obstetrical manipulations, fetotomy, and caesarean section were usually, functionally and secondarily, related to large animal surgery and the surgeons. Pathology and infectious diseases of reproduction for large animals were often parts of medicine. Reproductive problems of dogs and cats were handled with small animal medicine and surgery. Artificial insemination, physical diagnosis of the male and female genital systems, and semenology were orphans and frequently had received but short shrift.

In large animal practice in commercial herds, herd fertility work still tended, too typically, to be shunned. Exceptions were a few, largely self-trained veterinary specialists, practicing in elite herds of cattle or with studs and bands of brood mares.

The characteristically understaffed veterinary schools of the past allowed for very few faculty members whose teaching assignments were not primarily in surgery and/or medicine. With a few notable exceptions, concern with reproduction was secondary. Mostly, there were departments of surgery and obstetrics, or, medicine and obstetrics. Was it not natural for veterinary graduates to reflect their own individual student experiences?

It is notable that the name proposed for the new organization seemed inappropriate: The American Veterinary College (or Board) of Animal Reproduction. Literally, this meant an American college pertaining to animals of animal reproduction. At least, it was labored, redundant, and awkward.

Now, it is clearly evident that for this area of veterinary medicine, concerned with reproduction, there was a matter of identity, especially, a lack of veterinary identity.

For many years, research in reproductive physiology and in reproductive management had been dominated by non-veterinary institutions and by non-veterinarians publishing in non-veterinary publications. The physiologists were well organized in the Society for Study of Reproduction. There was an excellent, periodic Symposium on Animal Reproduction sponsored by the American Society of Animal Science. At several universities, within animal husbandry or dairy science departments, there were sections for teaching of and research on animal reproduction.

Nevertheless, as needs or opportunities within the livestock industry appeared, some veterinarians had extended their activities into the multitudinous facets of reproduction. Obviously, veterinary obstetrics was no longer appropriate nor descriptive of their scopes of activity. In fact, obstetrics had become minor. Phrases such as veterinary obstetrics, genital diseases, and animal reproduction, veterinary reproduction, breeding soundness represented combinations that were too limited or fell short.

This writer recognized the problem to be an extension of the same dilemma of two decades earlier when trying to develop an appropriate name for a new teaching section within the clinics at the then new School of Veterinary Medicine at the University of Minnesota. At that time, at a chance meeting and discussion with a scholar of classical languages, whose name I've forgotten, the term theriogonology, note gon had surfaced.

Granted, veterinary gynecology and veterinary andrology were established words in Europe. But, herein was a problem. In their origins from the Greek, gynos does not mean "female". It means "woman". Andros does not mean "male". It means "man".

Out of frustration was born opportunity. A new organization needed a new name. A growing area of veterinary medicine was in critical need of an identity and a name.

Professor Herbert Howe, Department of Classics, University of Wisconsin, was consulted. He was a long time teacher of a course for students of pre-medical sciences in the Greek and Latin origins of medical terminology. Professor Howe came up with close to the same proposal of twenty years earlier: theriogenology, note gen.

Professor Howe pointed out words in the then current dictionaries: Dorland's defined theriatrics as meaning "veterinary medicine"; theriotherapy as meaning "treatment of the diseases of lower animals"; theriotomy as meaning "dissection or anatomy of animals". These words derive from the Greek term therio, meaning "beast".

Also, one could find in Webster's International Dictionary theriatrics defined as the "science of veterinary medicine", therianthropic as pertaining to the "centaur", which both distinguished and defined beast and man; theriomorphic meaning "having an animal form".

Zoological taxonomists used the term Eutheria to delineate the subclass of placental mammals.

The New Random House Dictionary defined genesis as "creation" or "beginning", "generation", "birth"; genetic as "genesis" or "reproduction"; generate as "to bring into existence" or cause "to be".

Dorland's defined genesiology as "the sum of what is known concerning reproduction".

Howe's word, theriogenology, was etymologically correct. It gathered mammals - both male and female - and reproduction - both physiology and pathology. Usage could relate this properly structured word to veterinarians and to veterinary medicine. Has anyone ever heard of a gynecologist who was not a physician?

The possibility of an American College of Theriogenologists was first presented to the previously mentioned Organizing Committee in a letter dated 14 May 1970. Initial committee responses were prompt and substantially affirmative.

It was fortuitous that a timely and highly significant event occurred 30 August through 3 September 1970 at Brainard, Minnesota. Initiated and organized by Dr. Ray Zemjanis of the University of Minnesota, The Conference of North American Veterinary Educators in Animal Reproduction and Infertility was attended by 41 participants, representing 23 of 24 veterinary schools of USA and Canada.

This gathering marked the first time that most of the veterinary educators in the field of reproduction had ever been able to meet face to face in the same room. In fact, previously, many did not even know the names of their counterparts at comparable institutions.

At the close of this productive exchange, focused on "all facets of reproduction" in veterinary medicine, items 1. and 2. in the Summary of the Conference were:

1. Theriogenology or animal reproduction is a specialty that is an integral part of the veterinary curriculum.
2. The word theriogenology should replace the phrase animal reproduction and obstetrics in the veterinary vocabulary.

Concomitant with the educators' conference, the Organizing Committee decided to become the Organizing Committee for The American College of Theriogenology (ACT). Directly, a list was drawn up of invitees who were considered eligible to apply for certification and election as Charter Members. Curriculum vitae, including publications, were submitted to the Organizing Committee of ACT and to the AVMA's Advisory Board on Veterinary Specialties.

In the 15 December 1970 issue of JAVMA the following announcement appeared:

### **New Specialty Group Formed on Animal Reproduction**

A new veterinary medical specialty group, the American College of Theriogenologists, has been formed, with 29 charter members. Committed to advancing the professional education of veterinary practitioners, ACT seeks to fill a long-recognized need to unify, identify, and advance that branch of veterinary medicine concerned with the multitudinous phases of reproduction with which veterinarians are involved. The group plans, at an early date, to seek recognition as a specialty group of the AVMA.

On Friday 12 March 1971, the Organizing Committee of ACT, represented by Drs. Oberst, Faulkner, and Bartlett, again appeared before the AVMA's Advisory Board on Veterinary Specialties with more than a dozen of its members present. That year, most of the discussion centered around proposals for minor revisions of a constitution. No objections were raised in respect to any of the major principles.

Especially, one clause in ACT's constitution should be noted and recalled. It is unique among the AVMA's Boards and Colleges. Article IV Section 1 states: "The College shall evince a dedicated commitment toward the practitioner of veterinary medicine and shall develop special procedures for evaluation, recognition, and certification of competence of veterinary practitioners in therio-genology."

A positive attitude was assumed by the Organizing Committee of ACT as it set about plans for moving forward. Late in March, the ACT Organizing Committee was advised of probational approval by the AVMA's Advisory Board on Veterinary Specialties. In its April meeting, the Council on Education of the AVMA reviewed the recommendations of the Advisory Board and, based upon certain outlined contingencies, recommended to the AVMA's Executive Board and House of Delegates that The American College of Theriogenologists be given probationary approval.

Minutes of the organizing meeting of The American College of Theriogenologists, held in Parlor B of the Detroit Hilton, Detroit, Michigan, 19 July 1971 in conjunction with the joint Annual Meetings of the Canadian (23rd) and American (108th) Veterinary Medical Associations include the following statements:

1. Favorable action of the AVMA's 1971 Executive Board and House of Delegates granted The American College of Theriogenologists (ACT) probationary approval.
2. Seventeen of twenty-eight Charter Diplomates were in attendance.
3. Officers elected were  
First President - Dr. David E. Bartlett - 2 year term  
First Secretary - Dr. Lloyd C. Faulkner - 3 year term  
First Treasurer - Dr. Fayne Oberst - 2 year term  
First Executive Board Diplomate Members  
- Dr. Stephen J. Roberts - 1 year term  
- Dr. C. A. V. Barker - 2 year term  
- Dr. Raimunds Zemjanis - 3 year term

4. ACT's constitutional commitment to dedicate its efforts towards advancing practitioner education and opportunities in theriogenology was reaffirmed.

Successfully born, ACT undertook the task of achieving recognition - particularly recognition of the word theriogenology and the scope of theriogenology.

With remarkable rapidity, the academics set about the renaming of variously designated teaching units and courses at their respective universities. Within a year, theriogenology appeared in announcements of courses offered and in class schedules of several universities -, first at the Universities of Georgia, Purdue, and Cornell.

Fortuitously, a new edition of the principal text in the field, authored by Professor Stephen Roberts of Cornell, was in final process. It appeared under the title: Genital Diseases and Obstetrics (Theriogenology).

Presently, there seems to be little question that the rapidity of adoption of the words theriogenology and theriogenologist reflected their needs in the professional vocabulary of veterinary medicine.

For the first time, a succinct identity was provided. With a single word, a previously fragmented and undefinable field was unified and defined.

Not until delineation of an "ology" was it possible for there to be an "ist"!

In retrospect, the limited amount of dirision and ridicule elicited upon introduction of two new terms, theriogenology and theriogenologist, was more amusing than significant. It was short lasting. Students, who were already assimilating and digesting hundreds, if not thousands, of new words each year, were unmoved. For older veterinarians, whose professional vocabularies already included many thousands of words, addition of two more words should have been of no consequence. Theriogenology was soon found to be no more difficult to say than otolaryngology or anesthesiology.

The only regrettable occurrences that marred ACT's otherwise smooth emergence into the mainstream of veterinary medicine were the expressed disappointments - some very bitter - of a few, well qualified and prominent veterinarians not included among the necessarily limited number of Charter Diplomates.



Review of events since the birth of theriogenology establishes a satisfying list of accomplishments and significant consequent developments:

1. The faith and convictions of the Organizing Committee of ACT have been justified.
  - An ongoing, financially sound organization is in place with new officers and with new board members being elected annually, preponderantly from diplomates admitted to the college by examination. None of the six members of the Organizing Committee have held office since 1976.
  - The ACT examinations for diplomate status offered annually are attracting well-motivated applicants. As of the class of 1983, 109 additional veterinarians have completed examinations and achieved diplomate status.
  - Of particular note is the fact that several veterinarians in practice have already received recognition as diplomates of the ACT through presentation of their special qualifications and by examination. Thus, the constitutional commitment to veterinary practitioners and the moral commitment to the Society are being fulfilled.
  - A well-balanced College that will not become the exclusive territory of academics and researchers is assured.
  - The commitment to providing opportunities for furthering education in theriogenology has been met. ACT has organized and presented, assisted, and/or cooperated in presenting programs in theriogenology at annual meetings of AVMA, and the Western States Veterinary Conference.
  
2. Recognition of and definition for theriogenology quickly appeared in medical dictionaries.
  - Recent editions of Dorland's Illustrated Medical Dictionary define theriogenology as: "That branch of veterinary medicine which deals with reproduction, including physiology and pathology of male and female reproductive systems and the clinical practice of veterinary obstetrics, gynecology and semenology." Also, theriogenologic, theriogenological and theriogenologist are appropriately defined.

- Recent editions of Stedman's Illustrated Medical Dictionary define theriogenology as: "The study of reproduction in animals, especially domestic animals. This veterinary specialty includes the study of obstetrics and genital diseases in male and female animals, as well as the physiology of animal reproduction." Theriogenologic and theriogenological are appropriately defined.
- 3. In 1974, the American Veterinary Society for the Study of Breeding Soundness changed its name to the Society for Theriogenology. During a transitional phase of four years, both names were used. This change has been accomplished in an orderly and effective manner. The scope of the Society for Theriogenology was broadened to include all species served by veterinary medicine.
- 4. The scattered facets of veterinary medicine within the definition and scope of theriogenology have been gathered into several highly successful publications. Expansion and continued updating is assured.
  - In 1974, a new periodical appeared. Theriogenology: An International Journal of Animal Reproduction, was edited by the late Charter Diplomate Dr. John Kendrick. By 1984, a worldwide circulation to 31 countries had been achieved with approximately 800 subscribers. Since 1980, the Journal has been edited by Diplomate Dr. Victor W. Shille. Approximately 1200 additional contributions to the science of theriogenology have already been published in this new Journal.
  - In 1980, a 1287 page volume appeared: Current Therapy in Theriogenology, edited by Diplomate Dr. David A. Morrow of Michigan State University. There were 168 worldwide contributors, including many Diplomates of ACT. Already, a second edition is in process.
  - In 1984, a third edition of Diplomate Dr. Stephen J. Roberts' book will be available under the title: Genital Diseases and Obstetrics (Theriogenology).
- 5. Each year the papers presented at the annual meetings of this Society are appearing as The Proceedings of the Society for Theriogenology.

As the Journal of the Society for Theriogenology, a series of excellent monographs directed to practitioners has been prepared on specific clinical subjects such as: "Manual for Breeding Soundness Examination of Bulls", "Reproductive Examination of the Boar", "Theriogenology and the Equine", and "Canine Theriogenology".

6. Theriogenology has gained international recognition and acceptance.

- Resident in Australia, there are three ACT diplomates, in Canada, eight, and one each in New Zealand, Nigeria, Sweden, Trinidad, and Venezuela.
- Honorary Diplomat status in ACT is held by nationals of Belgium, Denmark, Netherlands, and Sweden.

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Having been around long enough to have observed that the past really is prologue to the future, I cannot resist offer of some comment upon the present with implication for the hereafter:

1. It couldn't have been better expressed than by Dr. Ray Zemjanis at the Educators' Conference in 1970. He said, "Theriogenology just can't make it as a liberal art."

Particularly, it should be hoped that the future leaders in theriogenology, especially those in academic and research positions, will digest and assimilate that laconic and veracious statement.

More than any other area of clinical veterinary medicine, theriogenology must be able to justify its existence and furthering in terms of direct new dollars to be generated for animal owners. Obviously, objectives of both food animal and companion animal owners, when looking to theriogenology for answers, is the obtaining of offspring - or more offspring - to sell or to keep and, in the case of dairy cattle, - more lactations.

We know that theriogenology offers practical, applicable, and valuable procedures that are still grossly underemployed. Why shouldn't the teaching sections at the veterinary colleges provide needed leadership by devoting at least 10% of their budgets and efforts toward developing and promoting old and new practices that demonstrate to animal owners the values, in economic terms, of theriogenology?

In an item last year in the Society newsletter, President Ed Lindner made clear his opinion that theriogenology was the "door opener" in a herd health practice.

I believe that both the Society and the College can and should contribute, substantially, to planned efforts toward ethical marketing of the knowledge and skills that are theriogenology.

Is not the increasing of market size the best and intelligent way to adjust to the sharply increasing number of veterinary graduates?

2. I disqualify myself from speaking about the directions of companion animal theriogenology. However, I would like to offer some comments upon some present and future aspects of bovine theriogenology.

Just as it has always been questionable whether a golden destiny would be found by the researchers pursuing N.I.H. grants, an overinvolvement by our academicians and clinicians with transplanting of embryos, if and when preordained for birth as tax shelters, seems somewhat dubious.

Solid genetic values, measurable in terms of real meat and milk, will, and should be, the ultimate determinants of continued volume use and usefulness of this fascinating and important technology. Future developments in cloning by nuclear transfer and gene transfer could, however, using embryo transplants, open the possibilities of spectacular economic advances in animal breeding.

3. Since 1970, we have seen, in veterinary medicine, vigorous and gratifying growth of many specialty groups that signify both the broadening and the deepening of professional competence. Strong and very independent organizations have been formed along two lines: (1) by species of animals served and (2) by physiological systems. Today, it is usual for veterinarians to hold membership in both the species group and the systems group reflecting their special interests.

It seems very important that members of the theriogenology organizations be actively involved in their respective species, practitioner organizations: bovine, equine, porcine, ovine and caprine, canine, feline, zoo, wildlife, laboratory animals, as the case may be.

However, competition between the systems and the species organizations is unacceptable. Divergence in programs and activities must be avoided. Parallelism will be unconstructive. A comfortable degree of convergence, interchange, and duplication of programs and activities

would seem to be sound objectives. Initiation and maintenance of liaison by the Society and the College are essentials.

4. Provincialism in theriogenology must be avoided. Thankfully, theriogenology has been and is being greatly enriched by graduates of veterinary schools from other than those in North America. A very few of our graduates have been broadened and deepened by opportunities for study overseas. Far more of our young veterinarians should be encouraged to experience the stimulation of the great veterinary institutions in other parts of the world.

5. Four and five decades ago, a few clinical pioneers were delivering programs whereby herd reproductive health and efficiency were monitored by scheduled, routine genital examinations. Established categories were periodically inventoried and appropriate actions taken. Managers were convinced of the value of these procedures and some managers were convinced they couldn't operate their herds without the information provided.

Then recognized limitations were the laborious systems for obtaining, recording, organizing, and retrieving of data. 5X8 cards, dropped behind file headings, were the usual. Use of hand punched cards, sorted with a knitting needle, was the elegant way. Clerical time required to cope with the mass of detail was considerable and was a critical limit to expansion.

Gradually, electronic data processing has evolved to the level of today's availability at the farm/herd level. The impossible is now possible.

Failure of theriogenologists to exploit, to the utmost, computer capability in herd management would be a disappointing example of a now fulfillable promise left unfulfilled.

6. My almost last comments may be too minor - but, I'd like to get them off my chest.

There are several words which I believe should be banished from our professional vocabularies.

The first is conception; especially, when used in conception rate. Definitely, it is wrong to use conception rate as synonymous with non-return rate.

Implying rate of fertilization and/or pregnancy, conception rate purports to quantitate events in populations that are inherently unknowns in the different individuals. Equally uncertain are the number of ova actually fertilized and the frequencies of early embryonal mortalities.

All that can be accurately determined is a rate of diagnosable pregnancy; so, why not use that term and purge conception rate.

Next, are the words breed, bred, breeding as verbs and breed and breeding as nouns.

Can you imagine the confusion of a translator of these words, or the consternation of veterinarians for whom English is not their first language, when confronted by words for which rules of grammar, context, and useage determine the specific meanings?

For example, one could write: When time to breed, the mares of best breeding were to be bred at the breeding shed by a purebred stallion of a different breed and then placed with the thoroughbred mares that had been bred and were either bred or not bred.

I trust that through confusion I have made my point clear.

Finally, we now have a useful and widely accepted word in theriogenology with its root meaning "animal/mammal" and with veterinary connotation.

Also, theriatrics and theriotherapy, are old and correct synonyms for "veterinary treatments" and for "veterinary medicine". Other very useful new words using the therio root could be developed.

Too bad that theriogenology is commonly abbreviated as therio. Far better that it be abbreviated as T. G. Why preempt use of the root therio from new uses for other and better purposes?

7. Finally -, what an enviable state prevails for today's veterinarians with interests in reproduction!

Needs existing in the animal industries afford opportunities.

The technical capabilities to increase reproduction and productive efficiencies exist.

Two strong, complementary organizations, dedicated to advocacy of theriogenology and to advancing education in theriogenology, the Society and the College, are functioning.

Your future can be and will be substantially influenced by how well these two vehicles are chauffeured.