TOUCHING BASE WITH THE PAULICK REPORT

BREEDERS' CUP FORUM: GAINING LIGHT YEARS THROUGH EQUINE RESEARCH

by Ray Paulick

The Grayson-Jockey Club Research Foundation is an extremely important funding source for scientific research on issues relating to the health and welfare of horses. In this second of a two-part interview, the organization's chair, Dell Hancock, and its president Edward L. Bowen, detail the positive, practical impact Grayson-Jockey Club-funded projects have made, highlight some ongoing research, and outline the process for selection among the many proposals received annually.

Hancock is a member of the family that owns historic Claiborne Farm in Paris, Ky. She has chaired the Grayson-Jockey Research Foundation since 2005. Bowen is a racing historian, Eclipse Award-winning writer, and former editor in chief of The Blood-Horse who serves as a trustee of the National Museum of Racing and Hall of Fame.

This is part two of the Breeders' Cup Forum with Hancock and Bowen .

What are some practical areas where research funded by Grayson-Jockey Club Research Foundation has made a difference?

Edward L. Bowen: One of the key recent developments, with far-ranging effects, was Dr. Sue Stover's work at UC-Davis which we supported. Because of the California requirement of necropsies of all equine fatalities, she was able to determine that most horses – as much as 90% – which suffer catastrophic breakdowns had pre-existing pathology. After a breakdown a jockey is likely to describe that it seemed like the horse "stepped in a hole," and the impression is of a sudden, spontaneous trauma. So often, though, the fact is that a problem had been developing. This has brought to light the importance of really good pre-race veterinary inspections, and I hope many trainers and veterinarians have taken heed and stepped up their own monitoring for soundness.

Even more recently, Dr. Mark Markel at the University of Wisconsin has established that bone morphogenetic protein treatment is equal to, or better than, bone grafting for treatment of large defects in the splint bone. Sometimes negative knowledge can be important, and work now being conducted by Dr. Regina Turner has established that commonly used treatments for testicular degeneration are not effective. This will save time, effort, and money from being wasted and is spurring further research seeking regimens that are effective.

Going back a few more years, but still in a recent context, when Charismatic was injured in the 1999 Belmont Stakes, attending veterinarians utilized work that at the time was very new, which provided confidence in their dosage of Xylazine in order to speed return to normal metabolism. The routine way of cooling out a horse after exertion is to walk him, but of course you cannot do that with a horse with an injured leg. Grayson had supported

the work of Dr. John Hubbell of The Ohio State University that developed that knowledge. Afterward, NYRA veterinarian Dr. Celeste Kunz remarked that “Dr. Hubbell’s guidelines enable us to treat within safe parameters and have improved the emergency care of injured race horses.” In non- scientific terms, that last sentence is “a mouthful” and the sort of result that underscores the importance of research.

Also at Ohio State, Dr. Alicia Bertone is already incorporating in clinical cases the techniques derived from her project entitled Molecular Therapy for Bone Injury.

Another key development came from the work on DNA vaccination conducted by Dr. Paul Lunn, who is now the chairman of our Research Advisory Committee. At the time, the phrase “DNA vaccination” sounded pretty Sci-Fi, but that work resulted in the first successful use of DNA vaccination to protect horses from infectious disease.

Skipping back over the 70-plus years since the original Grayson Foundation was established (1940), other key research results have included:

*Determination that high toe grabs on front shoes increase risk of injury in Thoroughbred racing.
*Development of the “physiological trim” to promote healthy hooves.
*Development of vaccines for Equine Viral Arteritis and Equine Influenza.
*Identification of the cause of virus abortion, leading to a vaccine.
*Define aspects of passive immunity in foals.

It is hard to resist looking ahead, too. We have been funding research on stem cell therapy for a number of years, and I think the overall medical community is confident that major steps are going to be made in this field. Also, a pet project in my mind is the study at Colorado State aimed at evaluating serum markers to alert to changes indicating oncoming bone or joint trouble. So far, the researchers have attained a 79% accuracy in “predicting” developing problems. Imagine handing that weapon to a race horse trainer!

What projects are under way right now that you hope will lead to either some break-throughs or better understanding of a major topic?

Edward L. Bowen: We pride ourselves on our selection process, so we expect worthwhile results from each of the 16 projects currently being funded. We expect at least one peer reviewed publication to result from each project we fund, and our veterinary consultant, Dr. Johnny Mac Smith, monitors all projects to make sure scheduled progress reports are forthcoming.

Among the current projects I personally am most excited by involves the terrible scourge of laminitis. Again, I turn to Dr. Dean Richardson, who recently referred to a laminitis project: “The G-JC supports work being done by Andrew Van Eps (University of Queensland) on the form of laminitis secondary to excessive weight bearing, i.e., the type associated with catastrophic fractures. This should allow us to understand if the lamellae fail due to deficits in energy delivery or alterations in energy use by cells when the foot doesn't cycle (load and unload) normally.

If we can figure out measurable indices by taking miniscule tissue fluid samples during a prolonged overloading situation, we will have an objective means of developing both mechanical and biological techniques that might prevent laminitis. Because of my own interests as a surgeon, I am particularly excited about this work. Others [researchers] are elucidating the mechanisms of endocrine and metabolic disorders that lead to laminitis using research techniques that simply are light years ahead of what was available even five or six years ago."

In our line of work, a phrase like that last one coming from a widely respected scientist makes us feel like we scored a touchdown.

Among other current projects potentially with far-reaching ramifications is Dr. Robert Mealey's work on piroplasmosis at Washington State University. The tunnel vision of Grayson-Jockey Club tends to look first and foremost at helping the animal itself, but it is also a fact that disease or injury can have major economic consequences. Piroplasmosis outbreaks not only can cause death or abortion, but could prompt devastating restrictions on import/export and interstate transport. There is no vaccine. The aim of Dr. Mealey's work is to determine what type of immune responses are necessary and to determine the degrees of immunity potentially generated by selected treatments (aimed at clearing the infection).

Race-day medication is a hot topic right now. The South African EIPH study demonstrated the efficacy of furosemide. Has there been research or is any under way that addresses whether EIPH is a heritable trait or whether furosemide enhances performance of all horses, not just bleeders?

Edward L. Bowen: We do not have anything on our plate on those subjects, so we referred the question to Dr. Ken Hinchcliff, a well-known international researcher on EIPH now with the University of Melbourne. Here is his response:

1. "There is work from South Africa which purports to demonstrate that epistaxis (as opposed to EIPH) is heritable, but it should be interpreted as a good start, not definitive."
2. "There is no evidence that the effect of furosemide is restricted to horses with EIPH. Quite the contrary, the data is based on all horses receiving furosemide, many of which presumably did not have EIPH, and not a subset with documented EIPH. It could have been that the effect was restricted to only horses within the dataset which had EIPH, but there is no way of knowing that now. While it might be plausible to infer that the association of furosemide administration and improved performance occurs only in horses with EIPH, there is no persuasive evidence that this is the case."

What's the process by which the Foundation solicits and ultimately determines what kind of research to fund?

Dell Hancock: The process starts during the summer when our staff sends out reminders to deans of university research departments that our deadline is Oct. 1. Once the proposals are in, our

veterinary consultant, Dr. Smith, assigns them all to groups of four on our Research Advisory Committee (RAC). Our evaluation process was refined in 1999 and was designed by Dr. Larry Bramlage and Dr. Gary Lavin, both board members.

The 32 individuals on the committee represent various disciplines of research as well as racetrack and farm veterinarians. The teams of four fill out score sheets and submit them, and then we collate all the scores and convene the committee in person in Fort Worth. (Dallas/Fort Worth has proven practical to reach since these people come from all over the United States.) The RAC meets for three days and pores over every project, ranking them numerically, top to bottom. Those rankings are turned over to the board of directors, who meet to determine how many of the top projects can be funded with that year's available budget. The board, of course, has the authority to alter the list, but we have so much confidence in the advisory committee that we don't make changes. We can look our donors in the eye and assure them their generosity is being directed at the best research available, regardless of where it originates.

I have attended the Fort Worth meeting several times and am always impressed at how well the committee members work together, how the academic types and practitioners interact together, and how devoted they all are to making sure they recommend only the best and most important research. The RAC is chaired by Dr. Paul Lunn, who succeeded Dr. Bramlage. Dr. Lunn has told us that our process is looked on as the gold standard and is being imitated by other groups. I want to add that the RAC and the board serve without pay.

Do research priorities change due to contemporary events (i.e., high profile racing injuries, MRLS, etc.)?

Dell Hancock: The equine research community is very knowledgeable about what is going on, so it will respond, and we do, too, but almost always within the framework of careful, competitive research. Our scoring process for all projects places a high priority on "Impact." So, if the science and budget pass the test, a project addressing a major current problem is likely to rise toward the top in the Research Advisory Committee's rankings.

In the last 20 years I think the only events which have caused an abrupt shift in emphasis have been EPM and MRLS. The outbreak of Mare Reproductive Loss Syndrome was a true emergency and one of the few situations which we felt justified an ad hoc response. We co-funded a major initial study with the state of Kentucky. Then we worked with Rood and Riddle on a project, in conjunction with the University of Kentucky, and funded it successfully, and held an open meeting for horsemen to have expert scientists recommend management practices.

In the case of EPM, it was very serious and very visible, but we were able to stick to our schedule and procedure of accepting various grants and requiring that they competed with our other slate of proposals. We also brought a group of scientists together for a workshop on the subject.

The case of Barbaro probably caused an increased emphasis on laminitis in many people's minds, but for years laminitis had been a high priority for us, anyway. The increased emphasis

from the scientific community itself no doubt brought about an increase of excellent research ideas. If we fund more laminitis projects than we would have otherwise, it is because more projects on that subject earned their way in, rather than our saying “We will fund X number of laminitis projects or spend X percentage of our budgets on laminitis.”

This doesn’t mean that we are inflexible. In the case of Shock Wave Therapy, a few years ago, Dr. Lavin, our vice chairman, made the suggestion that our Research Advisory Committee recommend the board of directors save out a small portion from the year’s budget and issue a call for proposals. Even though this was a special call, we still had a competitive process, and judged which one was best. Dr. Scott McLure at Iowa State University submitted the project that was selected. His results had a bearing on some racing commissions’ and racetracks’ rules on how long before a race a horse could have shock wave therapy. This is very important. The technology that can help a horse can also pose a threat if it is overused. The fear is that a horse at risk of injury will not have the warning of pain, because of the therapy.

Do you try to strike some kind of balance between research that affects breeding vs. racing?

Edward L. Bowen: I would say we monitor the projects to make sure we don’t stress one to the detriment of the other. However, this tends to take care of itself. As Dell said, the equine research community is highly attuned to the practical needs of the industry as well as the philosophical ideal of promoting horse health and soundness. We receive a broad range of proposals from the various specialists, and in any given grant cycle it works out that some from various areas gravitate to the top. I don’t remember the board ever altering the RAC’s ranked list of funded projects to avoid a skewing toward either racing or breeding topics.

Why do research projects seem to take so long from the time they are funded until the results are published in scientific journals?

Edward L. Bowen: I don’t mean to be trite, but I would say the simple answer is that there is more good science being accomplished than there are legit peer review scientific journals and personnel to evaluate them. A backlog seems inevitable. Anything that shortened the process probably would have been seen in the scientific community as lessening the validity, although to old weekly magazine guys like you and me the time lapse can be frustrating. Fortunately, however, a lot of papers based on Grayson projects and other research are presented at veterinary meetings. The AAEP always presents numerous papers at its annual convention in December, and the papers are published in the proceedings book. So, in many cases, the information gets to the people who can use it more quickly than it might seem.