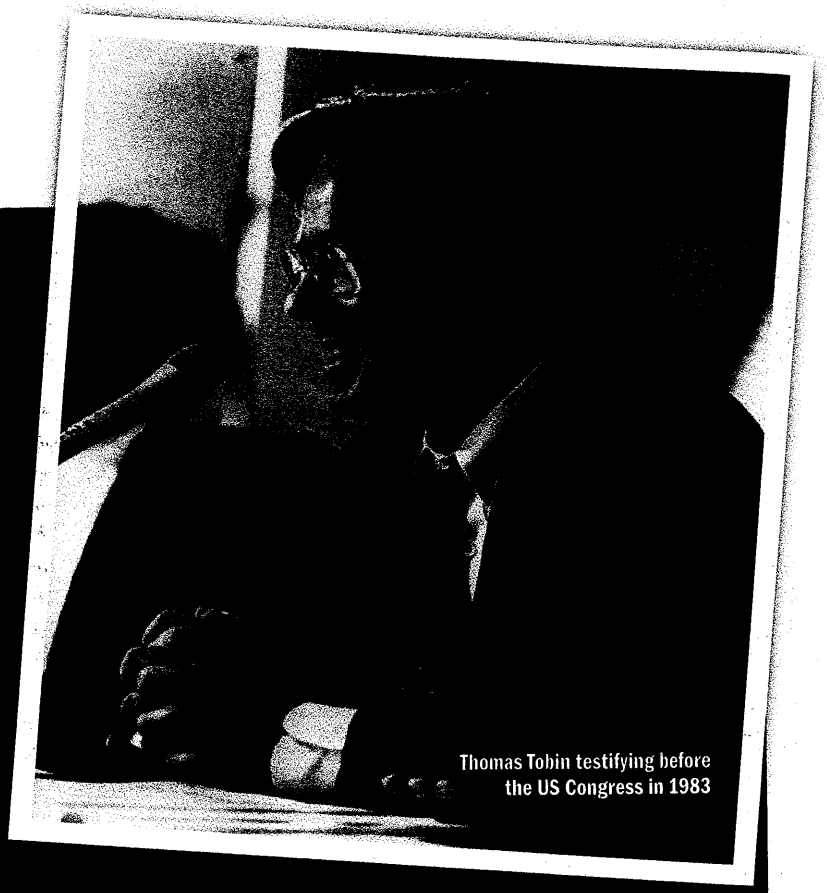
Race for the prize



Thomas Tobin testifying before the US Congress in 1983

With a career that dates back to the fifties and includes stints in Ireland, Toronto, Michigan and Kentucky, Thomas Tobin has never rested on his laurels and continues to work hard on ground-breaking research in the equine field. Here, the author of '*Drugs and the Performance Horse*' speaks to Robert Hogan

What motivated you become a veterinarian?
In 1958, I was 16 years old; my family roots are in Tipperary and Wexford. As a veterinarian, I could expect to make a living in rural Ireland; so I elected for veterinary medicine.

You studied in Guelph then took your PhD at the University of Toronto, then took a position at Michigan State University. What were the reasons behind this and how did you find each experience?
When I graduated in 1964, Professor Kelly was looking to identify a veterinarian to train in pharmacology and return to Dublin. At his suggestion, I went to Guelph to take an MSc in pharmacology.
In Guelph, I began researching the basic membrane pump mechanism of sodium transport. I decided to stay in North America and continue researching this area, next taking my PhD in the Medical Center Department of Pharmacology at the University of Toronto in 1970.
Toronto was 50 miles from Guelph but a very different world. I studied under Amar Sen and, through him, with Bob Post of Vanderbilt University, the cutting edge of sodium pump research. My first research paper was published out of Vanderbilt University, my first senior author paper published as a letter in nature; a Danish colleague, Jens Skou, discoverer (with input from Bob Post) of the sodium pump, won a Nobel Prize in 1997. These folks had methods that worked, so my research became a delightful daily conversation with nature. At a personal level, courtesy of various inputs, including one from Dublin Castle, I became a Massey College Junior Fellow, living on campus in very 'Oxbridge' academic style, a small private college suite, maid service, buttery bar, formal dining hall - complete with high table, and full academic gowns. One memorable high table guest was the Duke of Medina Sindonia, whose ancestor, my father informed me, had led the Spanish Armada; Toronto was a simply fascinating place to study, work and live.
One of the few things that bothered me at Toronto was the fact that, though I was absolutely confident that I had figured out the sodium pump, my insights had little practical application. This circumstance encouraged me to redirect my career towards applied veterinary medicine as I completed my doctorate at the University of Toronto.
From Toronto I went as a faculty member to Michigan State University. I was tenured at MSU in 1974, and had begun writing what became *Drugs and the Performance Horse.*

In 1975, you moved to Kentucky and you've been settled there since. How do you find life in Kentucky?
It's never dull! First, and most importantly, Kentucky got me out of basic science and back into applied veterinary medicine, which is, to use a Kentucky colloquialism, 'where the rubber hits the road'. In Kentucky, I soon found myself defending Kentucky's liberal medication policies throughout the United States. In 1983, I testified before Congress, killing the Corrupt Horseracing Practices Act, which would have made the medication of racing horses a felony. One outcome of these activities was that support for equine medication research was written into law in Kentucky, a law which still stands.

You started the research that began ELISA testing in horse racing, how did this come about?
Our research in the 1970s showed that morphine makes horses run faster, suppresses pain, and allows them to finish stronger; a perfect 'hop', except for the minor inconvenience that morphine was detectable. However, etorphine, 10,000 times more potent than morphine and known on the racetrack as 'elephant juice' was being used freely. There was no test for etorphine, and it was also reportedly being used by a rather famous and successful trainer.
The upshot was that in 1985 I was specifically requested - read: ordered - by Brownell Combs, Chairman of the Kentucky State Racing Commission, to "fix the problem of the abuse of etorphine in racing horses" and to "come back in two weeks and tell me how you're going to do it". I assured him that he could consider it done, and went immediately to my office telephone.
The answer that I got back was "make immunoassays". I went back to Commissioner Combs with a four year/$1m project. I figured that in four years I would have either solved the problem or failed spectacularly - there being no point in doing anything, including failing, by halves. As it turned out, we hit a home run; within two years we had adapted ELISA testing, basically home pregnancy type tests, to racing chemistry. Overnight, the sensitivity of testing had increased 1,000 fold, and in New Mexico in 1988 application of this new technology led to disciplinary action against approximately 40 trainers.

In two years we had also created highly successful proprietary technology on campus, a new circumstance in Kentucky. This process raised some serious, 'dust', let's just say, but when the dust had settled, in Kentucky and elsewhere, first I had survived the process, second, we had created the first company ever 'grown' on the University of Kentucky campus, later sold to Neogen Corp. Neogen Lexington now employs about 100 people and brings $50m/year into town. This was my second venture in the Intellectual Property area, the first being a patent I obtained on a morphine detection methodology in the early 1980s.

Can you tell me about some of the studies, research projects and papers you have been involved with throughout your career?
Equine Protozoal Myeloencephalitis (EPM) is an insidious central nervous system disease; 99% of American/ Kentucky horses are exposed and it causes significant disease in a percentage of these horses. Working with Dr David Granstrom, we saw some very interesting responses to an antiprotozoal medication called diclazuril. This led to me carefully review the literature flying home to Ireland one summer night in 1996. Halfway across the Atlantic, I realised we had an absolutely unique situation; we were attacking 800m-year-old chloroplast related material in a protozoan parasite in the brain of the horse with a herbicide related drug. As soon as I got back to Kentucky we filed patent, this patent underlies the first FDA approved treatment for EPM.
Fast-forward to 2001: we went to the Kentucky Derby on May 5, 2001 with the equine abortion storm from h–ll on its hands. In three weeks, Kentucky had lost $300m worth of early- and late-term foals. When I came to work on Monday, it was my problem. I was a toxicologist, the infection disease folks had concluded it was a toxicological problem. The message was: Tom, you sort this one out. Long story short, the abortions were caused by a coincident three week plague of Eastern Tent Caterpillars, which became obvious to even the most obstinate when the caterpillars returned the following year. On July 9 of that year I chaired a review meeting, slept on it and the next morning, July 10, sat down and wrote out a simple, but biologically unique and unprecedented, mechanism for the abortions and the associated cardiac and eye lesions. To this day it irritates me that I could see nothing patentable in this specific mechanism, but I was careful to copyright my writings and personally register the copyrights. My colleagues read my first draft proposed mechanism with various levels of disbelief, however, eight years later they are slowly coming onboard although, and let me put this politely, each in their own uniquely individual ways.
In the late 1970s we did the research that led to the approval of Lasix in American racing. This comes between the corrupt horse racing practices act and ELISA testing. Another very practical question that we addressed, starting in the late 1970s, was whether or not Lasix (furosemide),

then being used to prevent 'bleeding' (epistaxis), interfered with urinary drug detection. We showed that it did, but we also showed that the effect lasted for only four hours. Based on this research, Lasix was approved for use in American racing as long as it was administered four hours prior to post, the four hour Lasix rule is now long in place in American racing. What remained unclear, however, was whether or not Lasix actually prevented bleeding; this was an open question until the definitive research in this area was performed in South Africa last summer. This work, 30 years after the approval of Lasix in American racing, finally showed that Lasix administered prerace does reduce the incidence of Exercise Induced Pulmonary Hemorrhage (EIPH) in horses. Having been closely involved in the original approvals of Lasix in American racing, I was personally very pleased to see it proved effective and appropriate, even if the process had taken another 30 or so years.

The Alltech FEI World Equestrian Games take place in Lexington this year, how much are you looking forward to the event?
One of the delights of coming to Lexington was the opportunity to join the large local community of Irish folks/horsepersons, sometimes referred to as the 'Irish Mafia'. One of the first members I met was Pearse Lyons, at just about the time he was founding Alltech. Pearse and his wife Deirdre are a couple of enormous charm, energy, talent, taste and vision; as well as building a major international corporate enterprise, they are bringing the entire equestrian world to Lexington for the Alltech FEI World Equestrian Games. All Kentuckians, all Lexingtonians and the entire Irish community worldwide look forward to the Alltech FEI World Equestrian Games as a celebration of equine sports, and of the unique roles of Ireland and Kentucky in equine sports worldwide.

What was behind your decision to move to the University of Michigan?
Simple; when I finished my doctorate at Toronto I had a number of offers, including a postdoctoral fellowship with Earl Sutherland at Vanderbilt University Medical Center. On the other hand, I had an offer of a tenure-track faculty position at Michigan State University in a department which trained medical, osteopathic and veterinary students; no contest. I chose the tenure-track option, going from instructor to associate professor in four years.

What has changed the most, in your opinion, in the veterinary profession since you started your career?
Penicillin was identified in the year that I was born, and since then our ability to create highly effective therapeutic medications has increased dramatically, more narrowly, the sensitivity of drug testing in humans and horses has improved well over one million fold in sensitivity since I graduated from Dublin.

You've achieved a huge amount in your career, and, as we can see from the peer review paper, you're not resting on your laurels. Would this be a fair assessment?
As we speak, we are licensing our drug testing reference standard technology, I am working on adapting the EPM therapeutic approach to human medicine, and I think we have identified some of the fundamental mechanisms underlying equine laminitis.

What's next?
I hope to have some luck with regard to each of the three projects mentioned panning out in the not-too-distant future. One of the things I learned at Toronto was to absolutely trust my scientific intuition; these projects will all come to fruition in one way or another eventually, for me personally, however, I would just like to be the one to get them done.

You must have had a lot of support throughout your career?
I need to thank an enormous number of people for working with me and helping me over the years and without whom none of these projects would have been possible. On a personal level, I must absolutely thank my wife Vicki and my daughter Mary Courtney for their support and tolerance over the years. I would also like to take this opportunity to extend my warmest birthday wishes to my mother, Mary Tobin of Nine Mile House, Co. Tipperary, who celebrates her 90th birthday this August 27. And, equally importantly, on behalf of all of his children, to remember our father, Nicholas Tobin, [the Dublin Castle connection], a scholar, a gentleman and a parent without compare, who was particularly careful to see to it that all of his children were well educated. I also need to thank all of the people that I have worked with over the years, and without whom none of these projects would have been possible, to thank my wife Vicki and my daughter Mary Courtney for their support and tolerance over the years, and in closing my parents.