Before House Subcommittee

Tobin Testifies On Bute, Lasix, Testing

Dr. Thomas Tobin, at the invitation of the House Judiciary Subcommittee on Criminal Justice, testified May 18 on hearings on the "Corrupt Horseracing Practices Act of 1983." Dr. Tobin is professor of veterinary science and professor of toxicology at the University of Kentucky. He appeared at the Washington, D.C. hearings at his own expense, receiving no remuneration for his time or expenses from the HBPA.

Mr. Chairman, members of the subcommittee, my name is Thomas Tobin. I graduated in veterinary medicine from University College Dublin in 1964 and completed a Ph.D. in pharmacology-toxicology at the University of Toronto in 1970. Thereafter, until 1975, I was a faculty member in the Department of Pharmacology, Michigan State University, East Lansing, Mich.

In 1975, I was invited to set up the Kentucky Equine Drug Research Program, and I have been at the University of Kentucky since 1975. Currently, I am professor of veterinary science and a professor of toxicology at the University of Kentucky. My research program is an independent research program funded by the Kentucky State Racing and Harness Racing Commissions.

Since 1975, this program, in conjunction with my colleague, Dr. Jerry Blake and the Kentucky Equine Drug Testing Program, has published two books and about 85 research papers on the detection, actions, uses, and effects of drugs in racing horses. Both programs have completed considerable research on furosemide or Lasix in horses and are currently working on research concerning phenylbutazone in horses.

Mr. Chairman, today I will speak to:

1. The bleeder, and furosemide or Lasix.
2. Phenylbutazone, the horses' equivalent of aspirin, and its effects in racing horses.
3. The illegal medications.
4. Medication control and the drug testing process.
5. The Canadian federally controlled testing system: a comparison with the United States system.
6. The effectiveness of current United States testing systems.
7. Testimony by (Marc) Paulhus that Kentucky has "a mediocre drug testing laboratory."
8. The problem of trace levels or residue determinations in racing horses.
9. Summary and conclusion.

THE BLEEDER

1. If you take a thoroughbred horse, run him a mile at top speed, you will find that about 1 to 2 per cent of horses will trickle blood from the nose post-race.

2. This is the classic bleeder — known 300 years or more. Occasionally a horse will die from bleeding, though this is rare.

3. It has long been thought that some horses bled in lungs without blood appearing at the nose. These were called "occult bleeders."

4. The flexible fiberoptic endoscope became available in veterinary medicine in the late 1970s. Using this instrument, it was found that:

   (a) 1 to 2 per cent of horses drip blood from nose
   (b) 40 to 70 per cent of all horses show signs of blood in the windpipe
   (c) About 10 to 15 per cent show substantial amounts of blood in the windpipe
   (d) About 10 to 15 per cent show flecks of blood in the windpipe
   (e) About 20 to 30 per cent show in-between amounts of blood in the windpipe

5. This work showed that bleeding into lungs and bringing blood up into the windpipe is very common in horses post-race.

6. When horses bleed in a race, they may stop and wreck a field of horses. This results in risks to life and limb for horses and jockeys.

7. There has long been a search for a drug which will help bleeders.

8. Current drug of choice of the veterinary pro-

fession for bleeders is furosemide. It has been approved for use in racing horses by some racing commissions.

FUROSEMIDE — LASIX

1. A very effective and safe diuretic in both horses and humans.
2. Fifth most commonly prescribed drug in human medicine, and there is no reason to think that it is any less safe or effective in the horse.
3. Furosemide is specifically approved by the FDA for use in pulmonary congestion in the horse.
4. Because pulmonary congestion is a likely cause of bleeding in the horse, there is direct medical rationale for the use of furosemide or Lasix in bleeders.
5. Horses with atrial fibrillation, who suffer pulmonary congestion, have a much higher incidence of bleeding than normal horses.
6. Clinical experience of equine veterinarians and horsemen suggests that furosemide is effective in the treatment of epistaxis or bleeders.
7. Based on this evidence, there is a clearcut pharmacological basis, a clear medical rationale, regulatory approval, and clinical evidence from both university hospital studies and equine practice to support the use of furosemide in the prophylaxis of epistaxis.

EFFECTS OF LASIX IN HORSES

1. One of the reasons that Lasix is a very safe drug is that it is a very short acting drug.
2. When a horse is dosed with Lasix to prevent bleeding, only 250 mg of the drug is given IV into the jugular vein.
3. The formation of urine (the diuretic effect) peaks within 15 minutes and is essentially over within one hour.
4. About four liters of extra urine are formed and voided, usually within one hour of drug administration.
5. While this effect looks quite dramatic, one must remember that this is only about 2 per cent of the body water in the horse.
6. Because of this, Lasix is unable to move or flush more than 2 per cent of any drug out of the body of a horse. This amount is forensically insignificant.
7. Furosemide is therefore a very safe, short acting drug and it does *not* reduce the level of any drug in the body of a horse.
8. In a nutshell, *Lasix does not flush drugs* out of the bloodstream of the horse.

LASIX AND DRUG DETECTION: THE "MASKING" EFFECT

1. Lasix is not known to affect the detection of any drug in blood.
2. Lasix does *not* reduce the concentration of basic, lipid soluble drugs in urine.

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3. Lasix *will* reduce the concentration of some water soluble drugs and drug metabolites in equine urine.
4. Because the action of Lasix is short lived, these dilution effects are over within about three hours, if the dose of furosemide is the dose recommended (250 mg) by the American Association of Equine Practitioners.
5. By giving Lasix four hours prior to post time, at the anti-epistaxis dose, *no* masking or drug dilution effects or interference with drug testing is encountered.
6. In studies at the University of Kentucky, it was found that the detection of six narcotics was not affected and that there was some evidence for enhancement of the detection of these drugs four hours after furosemide administration.
7. Preliminary studies by Dr. George Maylin in the NASRC Quality Assurance Program have shown that with the recommended dose and time constraints, furosemide does not affect the detection of the following drugs: cocaine, caffeine, lidocaine, apomorphine, phenylbutazone, fentanyl, oxymorphone, clenbuterol, flunixin.
8. Therefore, if the dose of furosemide is 250 mg IV and it is given four hours prior to post-time, furosemide does not "interfere" or mask drug detection and may enhance it.

DOES LASIX AFFECT THE PERFORMANCE OF HORSES? DOES IT "SPEED" HORSES UP?

1. Studies at the University of Kentucky, the Ohio State University and a study of track times at

Louisville Downs racetrack all show that Lasix does not improve the performance of horses.

2. Therefore, horsemen cannot use Lasix to "move horses up" or improve their performance. Therefore, Lasix cannot be used to run horses "hot" and "cold."

3. Horsemen and equine veterinarians, based on their experience, are of the opinion that Lasix helps horses run "easier" or "easier in their wind" and makes them run more reproducibly and reliable; i.e., true to form.

4. If a horse is a bleeder, he is likely to bleed again. Horsemen who own such horses have a keen desire to be permitted to run them on Lasix.

IS LASIX TOXIC TO HORSES?

1. Lasix is a very safe drug, in both humans and horses.

2. Doses used in horses are small and the drug is rapidly excreted.

3. No evidence of toxic effects after single or repeated doses.

4. As used on the race track, in single, small, isolated doses, this drug is essentially nontoxic in horses.

SUMMARY

1. Bleeders are a common and very significant problem in racing horses.

2. Bleeders lead to risks to life and limb of horses and jockeys.

3. The treatment of choice is furosemide.

4. Furosemide is safe, effective and approved by FDA for use in horses.

5. Properly used, it does not affect the detection of drugs in blood or urine; does not "mask."

6. Does not "move horses up."

7. There is absolutely no evidence to suggest that this treatment is cruel or inhumane to horses.

8. Lasix is a rational therapeutic choice for a very common condition in horses. Its use may save the lives of both horses and jockeys. Denial of horsemen the right to use this drug in racing horses is illogical in terms of human endeavor and inhumane to the horses.

"DRUGGING" OF HORSES BY FUROSEMIDE

According to Webster, drugging means (1) to put a *harmful* drug in, (2) to stupefy or poison with or as with a drug, (3) to administer something nauseating to.

Mr. Chairman, members of the subcommittee, nothing whatsoever that I have said about Lasix meets any of the above definitions. To administer Lasix to a horse is in no way, shape or form the "drugging" of a horse.

PHENYLBUTZAZONE: ITS EFFECTS IN RACING HORSES

A. PHENYLBUTAZONE: A NON-STEROIDAL ANTI-INFLAMMATORY DRUG.

1. Phenylbutazone is a member of the non-steroidal anti-inflammatory group of drugs. Aspirin is the principal member of this group of drugs that you are familiar with.

2. In general, if you wish to keep phenylbutazone in the horse in perspective, it is useful to think of it as being basically horse aspirin.

3. Phenylbutazone and aspirin have little effect on normal pain perception. It is the *hypersensitivity* to pain associated with the inflammatory process which responds to phenylbutazone and aspirin.

4. The hypersensitivity to pain associated with inflammation (such as a sunburn) is caused by prostaglandins. Prostaglandin concentrations in tissues increase and the inflamed area becomes hypersensitive.

5. Phenylbutazone and aspirin block prostaglandin biosynthesis, reduce tissue hypersensitivity, and *normalize* pain perception in the affected area.

6. They leave the area with *normal* pain perception. They do *not numb* any area in the *body* of a horse.

PHENYLBUTAZONE: COMPARISON WITH OTHER DRUGS

1. Phenylbutazone is not thought to be stimulant to horses. It has no more ability to stimulate an unusual performance in a horse than aspirin has in you or I.

2. Phenylbutazone is quite different from local anesthetics. These drugs are injected at specific points or into specific areas and "numb" specific areas. Local anesthetics block both pain and proprioception completely. Proprioception is the horse's awareness of where his leg is and what it is doing. Blockade of proprioception can lead to a misstep and a breakdown.

3. It is important to remember that phenylbutazone has no effect on normal pain perception or normal proprioception and is thus completely different from the local anesthetics.

4. Phenylbutazone is completely different from the narcotic analgesics. These (narcotic) agents act in the central nervous system (brain) to reduce the perception of pain. They act to reduce a horse's pain threshold, and, in addition, they are quite powerfully stimulant in race horses. Such a horse would be "drugged."

5. Phenylbutazone is therefore clearly distinct from local anesthetics which *numb* specific areas, and narcotics which suppress pain perception in the brain and stimulate horses.

6. Phenylbutazone has no depressant or tranquilizing effects in horses.

7. The principal pharmacological effect of phenylbutazone is to normalize an inflamed tissue and it has very little effect outside the area of inflammation.

PHENYLBUTAZONE AND BREAKDOWNS

1. Because phenylbutazone reduces the hypersensitivity to pain found in inflamed tissues, it has been argued that horses treated with this drug will run on injured joints and tendons and be more likely to break down.

2. This argument ignores the fact that there is no pain perception in the actual joint surfaces of horses. Phenylbutazone, therefore, cannot affect pain perception directly from joint surfaces, since there is none.

3. The great bulk of the resistance to joint movement is based in the soft tissues around a joint. Soft tissue resistance to joint movement in an inflamed joint is markedly reduced by phenylbutazone. This is the manner in which phenylbutazone restores normal performance.

4. Another important factor is that while protecting a hypersensitive limb, a horse may overload a sound limb. In allowing a horse to run evenly on both limbs, phenylbutazone may, under some circumstances, reduce the incidence of breakdowns.

5. The State of California legalized phenylbutazone at the end of 1970. Between 1970 and 1978, over which period the use of phenylbutazone steadily increased, the number of horses suffering breakdowns which required destruction of the animal remained relatively constant. Other analyses of this data suggest that the incidence of breakdowns actually decreased as the use of phenylbutazone increased.

6. Studies by the Colorado Racing Commission veterinarian, Dr. Gene Bierhaus, showed that over nine years the probability of a horse having an accident which required his destruction was not any greater if the horse was phenylbutazone-treated.

7. Pilot studies at the University of Pennsylvania found that the risk of breakdowns was one per 206 horses at risk, a rate of breakdown not higher than the incidence in New York and New Jersey, states which restricted the use of phenylbutazone.

8. These studies, but most particularly the California studies, appear to suggest that with a well run medication program the rate of breakdowns is not increased.

PHENYLBUTAZONE AND MASKING

1. There are no published studies and no reports of experimental studies that show that "masking" by phenylbutazone is a significant forensic problem.

2. The nature of the drug testing process is such that "masking" of stimulants, depressants, narcotic analgesics, tranquilizers and depressants and local anesthetics by phenylbutazone or its metabolites is small.

3. Oxyphenbutazone is the major metabolite in equine urine which causes masking problems. Its concentration in horse urine is controlled by the horse, not by the horseman.

4. Kentucky allows horses to run on phenylbutazone. New York and Canada do not. The positive call rate for illegal drugs in Kentucky is substantially greater than that in New York and Canada. "Masking" is therefore not a problem in Kentucky when compared with the New York experience.

5. I know of no scientific evidence which suggests that "masking" by phenylbutazone significantly interferes with drug detection. I believe that "masking" is not a scientific issue, but a political or, rather, a pseudo issue.

6. Detailed scientific studies on masking by phenylbutazone are now underway at the University of Kentucky.

PHENYLBUTAZONE: ITS EFFECT ON PERFORMANCE

1. Phenylbutazone is not thought of as changing a horse's innate ability to race.

2. By relieving inflammation, it may enable him to race nearer to his maximum capability.

3. It unquestionably will aid the horseman to field racing sound horses. It unquestionably will aid the horse to run a better, more comfortable race.

4. The use of drugs such as phenylbutazone is entirely ethical and legal in human sports medicine. There is no reason, therefore, to think that this type of medication is any less ethical and humane when used in horses.

PHENYLBUTAZONE: A SUMMARY

1. Phenylbutazone is a nonsteroidal anti-inflammatory drug of the same general class as aspirin.

2. Its primary pharmacological action is to normalize inflamed tissues.

3. It has no effects to reduce normal pain perception, or *"numb"* any tissues in the body.

4. Its use does not appear to be associated with an increased incidence of breakdowns.

5. There is no evidence that it makes testing for illegal drugs less effective.

6. It is thought to enable a horse to perform up to his innate ability and it enables horsemen to field racing sound horses.

7. Use of this type of medication is entirely legal, ethical and humane in human sports medicine. There is absolutely no reason to think that it is otherwise in veterinary medicine.

THE DRUGGING OF HORSES

According to Webster, drugging means (1) to put a *harmful* drug in, (2) to stupefy or poison with

or as with a drug, (3) to administer something nauseating to.

Mr. Chairman, members of the subcommittee, nothing whatsoever that I have said about phenylbutazone meets any of the above definitions. To administer phenylbutazone to a horse is in no way, shape or form the "drugging" or numbing of a horse.

THE ILLEGAL MEDICATIONS

1. All racing jurisdictions in the United States and all racing organizations are committed to preventing the use of:
   (a) Stimulants
   (b) Depressants
   (c) Narcotic analgesics
   (d) Local anesthetics
   (e) Tranquilizers
   in racing horses.
2. Stimulant drugs and narcotic analgesics are banned because, among other reasons, they make a horse unsafe to ride, unnaturally stimulate him, and may affect the outcome of the race. Such a horse would be drugged.
3. Depressants and tranquilizers are banned because they may be used to reduce the performance of a horse and thus affect the outcome of a race. Such a horse would be drugged.
4. Local anesthetics can block pain perception and proprioception from a limb. This may cause the horse to misstep and break down. Such a horse would be numbed.
5. Use of these agents in racing is illegal and strictly controlled by chemical testing of blood and urines.

MEDICATION CONTROL IN HORSE RACING

1. Horse racing has the longest history (since 1910) and the most extensive range of drug testing of any human endeavor. The scope of testing is wide, with 500 to 1,000 drugs common and a possible range of 40,000 drugs.
2. Drug testing depends on the testing of blood and urine samples from racing horses. Best drug coverage is obtained by testing both blood and urine.
3. If the blood is drawn and tested pre-race, the process is called pre-race testing.
4. Many medications, particularly among the illegal medications, are not *readily* detectable in pre-race blood testing.
5. Because of this, pre-race blood testing must always be run in conjunction with post-race urine testing for optimal drug coverage.
6. The combination of pre-race blood and post-race urine testing offers the best drug coverage and prevents the running of some illegally medicated horses.
7. *Exactly* the same drug coverage is afforded by post-race blood and urine testing. This is the system that Kentucky uses.
8. In Kentucky, each positive costs about $7,000 to fund. To install pre-race testing would cost at least $300,000 extra per year. This works out at an estimated cost of about $30,000 per pre-race positive. The average purse raced for in Kentucky in 1981 was $4,186.
9. Pre-race testing is clearly technically feasible for some drugs. Its efficacy and particularly its cost effectiveness is debatable.

THE CANADIAN TESTING SYSTEM: COST EFFECTIVENESS OF A CIVIL SERVICE CONTROLLED NATIONAL TESTING SYSTEM

1. In Canada, drug testing is directly under the control of Agriculture Canada; i.e., the Canadian Civil Service.
2. The contract for the testing is "let" to private laboratories; one in Vancouver, one in Toronto, and one in Montreal.
3. About 80,000 samples/year are tested by these laboratories.
4. The cost is about $40 (US) per sample tested for post-race urine testing (blood is only tested if urine is not obtainable).
5. A research facility with a budget (including start-up costs) of about $700,000 a year is being established in Ontario.
6. The positive call rate (Kentucky positive) of this system, very close to what this bill would mandate, is about 0.6 per 1,000 samples tested. This call rate compares unfavorably with Kentucky's 2.9/1,000 rate.
7. There is no evidence, therefore, that a drug testing system supervised directly by a federal government is any more effective than the current situation.
8. The costs of testing are relatively much greater in Canada than in most U.S. laboratories. The cost/sample is $20 in Kentucky.
9. The Canadian system does not include pre-race testing, mandated in HR 1694.
10. The Canadian system does not include quantitative testing of drugs in blood which will be necessary to regulate the next provision of the bill that I will speak to, which is the determination of trace levels.
11. Costs for a based testing system mandated by HR 1694 would inevitably be much (two to three times) higher than the current Canadian testing costs.

EFFECTIVENESS OF THE CURRENT UNITED STATES TESTING PROGRAMS

1. The attached table shows an analysis of the positive call rates of 18 U.S. racing states, and Canada.

2. Of these states:

Arizona	Kentucky
Arkansas	Massachusetts
Colorado	New York
Rhode Island	South Dakota
Pennsylvania	Idaho
Nebraska	Delaware
Maine	Montana
Michigan	West Virginia

all had positive call rates for hard or illegal medications equal or greater than that of Canada.

3. California and New York, at 0.4 and 0.8 positives/thousand, were less than but clearly comparable with Canadian call rate for positives.

STATE	$\bar{x}$ POSITIVE CALL RATE	±S.D.	N	YEARS
Arizona	0.6	±0.4	5	(1978-82)
Arkansas	2.5	±2.7	5	(1977-81)
California	0.4	±0.1	7	(1975-81)
Canada	0.6	±0.2	5	(1978-82)
Colorado	1.3	±0.5	6	(1976-81)
Rhode Island	0.6	±0.7	5	(1974-78)
Pennsylvania	2.2	±0.4	3	(1979-81)
Washington	0.3	±0.3	5	(1977-81)
Nebraska	0.9	±0.7	5	(1978-82)
Maine	1.7		8	(1975-82)
Michigan	0.6	±0.3	4	(1977,78,80,82)
Kentucky	2.9	±1.6	7	(1975-81)
Massachusetts	2.2	±1.5	7	(1975-81)
South Dakota	6.0	±6.8	6	(1976-81)
Idaho	2.3	±4.0	3	(1979-81)
Delaware	4.0	±1.6	5	(1978-82)
Montana	1.6	±1.9	6	(1976-81)
New York*	0.8** (0.4)***	±0.3	4	(1978-81)
West Virginia	2.2**	±1.1	6	(1976-81)

* Pre- and post-race bloods and urines

** Includes Kentucky permitted positives

*** Estimated positive call rate in New York for Kentucky Thoroughbred positives

As part of a study on phenylbutzone in horses by the Kentucky Equine Drug Research Program, a survey of the "positive call" rates in various U.S. racing jurisdictions was undertaken in November, 1982. On our request, the race horse medication statistics were provided by most of the state racing commissions or the authorized testing laboratories. These statistics included the number of urine samples analyzed, lists of positives called, and the medication rules for each jurisdiction in each year.

For each state, each year, the positives were categorized into Kentucky prohibited (stimulants, depressants, narcotics, tranquilizers, local anesthetics, and Kentucky permitted (NSAIs, diuretics, antibiotics, steroids) drugs. A "positive call rate" of Kentucky prohibited positives per 1,000 analyzed urine samples was calculated for each year and a mean over the years reported was generated for each jurisdiction.

4. The only interpretation possible from this table is that drug testing in U.S. jurisdictions compares very favorably with the federally run Canadian program.

TESTIMONY BY MR. PAULHUS THAT THE STATE OF KENTUCKY HAS A MEDIOCRE LABORATORY

The following documents are submitted in rebuttal:

1. Letter from Dr. J.W. Blake, director of the Kentucky Equine Drug Testing Program.

2. Letter from Dr. Thomas Tobin, Kentucky Equine Drug Research Program.

3. Table showing that Kentucky has a much higher "positive call" rate than the testing laboratories mentioned in the quote.

4. Attention is drawn to the previous table where Kentucky has one of the highest positive call rates.

5. Publication lists from the Kentucky Equine Drug Testing and Research Programs.

6. Based on this information, we know of no objective data to support this comment by Mr. Paulhus.

SUMMARY: CURRENT MEDICATION CONTROL

1. Post-race testing of blood and urine samples offers exactly the same drug coverage as pre-race and post-race testing at considerably less cost.

2. The federally controlled medication control program in Canada is less efficient than most and more expensive than all major United States drug testing programs.

3. This bill mandates pre-race testing and quantitation of residue levels. This process will be enormously more costly than the current method and, from the Canadian example, less effective.

ESTABLISHING TRACE LEVELS

"The administrator may, by regulation, establish permissible trace levels of substances foreign to the natural horse that he determines to be innocuous."

1. This simple sentence defines the critical decisions that the administrator will have to make that will send innocent horsemen to jail. The administrator will send innocent horsemen to jail because:

2. There does not currently exist any research base on which to determine these trace levels.

3. Even when this base is developed, the metabolism of the horse will introduce a substantial element of randomness into it.

4. Because of this, the administrator will have to coldly decide how many innocent horsemen he will jail.

5. The administrator will jail innocent horsemen because the state of the art of analytical chemistry is such that analytical chemists cannot tell when a drug was administered.

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6. For example, phenylbutazone has been detected in horse blood for up to nine days after the last dose, long after its therapeutic effects have ceased.

A critical question, therefore, is what is a "trace" and what is a therapeutic amount of each medication. This is a question that the administrator will have to answer for each medication, drug, and foreign substance that his chemists find in horse urine. Criminal prosecutions will hang on the outcome of these decisions. Therefore, basis for the administrator's decision must be solid and scientifically defensible. Further, because each drug is unique, the data will have to be obtained for *each* drug *individually* in the horse.

Where will the administrator get this information? The administrator will have to generate this information himself because this information is not presently available for any equine medication. To give you an idea of how complex this problem is, let me tell you what the administrator will have to do to enforce the regulations concerning phenylbutazone, the most commonly used equine medication, and the horse's equivalent of aspirin.

One way for an administrator to set a trace level is to determine the amount of phenylbutazone in the blood of a horse at, let us say, 24 hours after the last dose. If he takes this approach however, he will find that his experiments provide him with not just a single level but a range of levels. In determining the actual "trace" level that he is going to work with, the administrator will have to decide how many innocent horsemen he is going to convict. Only when he has made this decision can he go ahead and set the level. This is because the random variability in both horses and drug testing in horses make it inevitable that some horsemen who strictly obey the rules will accidentally go over the "trace" level and become felons.

On the other hand, the administrator may choose to determine at what blood level the pharmacological effect of phenylbutazone disappears in horses. He may then use this information to determine what is a trace level of phenylbutazone in the horse. To do this, he will have to actually study the actions of phenylbutazone on lameness in horses. First, the administrator will have to acquire some naturally lame horses so that he can actually measure the therapeutic effects of phenylbutazone. This has never been done in horses or, to my knowledge, in any other species. These are technically very challenging experiments. When he has worked out how he is going to measure lameness in horses, he will then be able to give them phenylbutazone and measure its anti-lameness effects. Then he will have to measure the blood and urine levels of phenylbutazone in these horses so that he can know what is an effective level of phenylbutazone and what is a trace level of phenylbutazone.

This is a substantial undertaking. It requires the acquisition of horses, the services of veterinarians expert in biomechanics, and analytical chemists. It requires the development of methods, likely high-speed cinematography, to measure and quantitate lameness and drug effects in horses. Such studies, for phenylbutazone alone, would take at least one year and likely longer. These experiments then would have to be repeated for each of the many non-steroidal anti-inflammatory drugs in the horse. Then the administrator would have to study the effects of combinations of these drugs so that he would be able to rule in circumstances where more than one of a particular type of drug was found in the bloodstream of a horse.

The administrator will have to work with blood levels of drugs and not with urinary levels as is now common in racing chemistry. The reason for this is that blood and urinary levels of drugs do not correlate very well. For example, urinary levels of oxyphenbutazone, a major metabolite of phenylbutazone in horse urine, can vary up to about 1,000-fold from its blood levels, depending only on whether the urine is acidic or basic. Because of this poor relationship between blood and urinary levels of drugs, one cannot use trace levels of drugs in urine for regulatory purposes. Traditional methods of regulating phenylbutazone use, by quantitating phenylbutazone and its metabolites in urine, are far too variable to serve a valid regulatory function.

There are about 4,000 drugs and 63,000 chemicals in common use in North America. Many of these will show up in horse urine and each one will have to be tested and a "trace" level established. This is a huge task and will require the addition of a substantial research unit to the regulatory structure.

It will not be possible for the administrator to simply adapt information from other species to the horse. This is because each species is, by and large, unique in its handling of drugs. Doses are different from species to species, the blood levels at which drug responses occur are different, and the metabolism and pharmacokinetics of drugs are different in the horse. If the Federal government wishes to get into the business of regulating equine medication, it will have to get into the business of researching medication in horses in a very substantial way.

54 Rep. John Conyers Jr. and the University of Kentucky's Dr. Tom Tobin went one-on-one recently in hearings on Capitol Hill. Gerald Strine finds UK is very good at that game.

MEDICATION

by Gerald Strin

CONYERS VS. TOBIN: READ IT AND SMILE

The June and July issues of THE HORSEMEN'S JOURNAL carried detailed accounts of the HBPA's May 18 presentation before the House Judiciary Subcommittee on Criminal Justice. The coverage included a general feature on the day's hearing chaired by Rep. John Conyers Jr. (D-Mich.) and the complete text of statements prepared by HBPA special counsel Caldwell Butler, Washington representative David Vienna, University of Kentucky veterinarian/pharmacologist Dr. Thomas Tobin and national president Ed Flint.

Now for the segment that undoubtedly had the greatest impact of all the words either written into the record or spoken at any of these Congressional hearings. It involved Tobin and Conyers, after Tobin had given his opening remarks. Conyers was determined to counter, with previous testimony, what Tobin had said in defense of Lasix and Butazolidin. The Detroit congressman apparently thought he had come well equipped for that task. He cited works by Dr. Robert Cook and Robert O. Baker, comments by Dr. Arthur Patterson and textbook quotations from *Equine Medicine and Surgery, Lameness in Racehorses*, the *Merck Veterinary Manual* and the *Journal of the American Veterinary Medical Association*.

This evidence, as presented by the humane groups at earlier hearings held by the subcommittee, had been pretty well accepted by the legislators. Very little had been offered by the racing industry to diminish its impact.

Conyers, for one, was only too happy to believe everything the spokesmen for the humane associations had told him. You've heard of "hostile witnesses," I'm sure, at hearings such as these. Well, Conyers is a "hostile chairman," so far as racing is concerned. He is as subtle as a Doberman. It takes a strong, polished witness to stand up under his cross-fire. And Conyers did, in all fairness, catch Tobin offbase — or, rather, out of his element — early in the proceedings when the Kentucky scientist volunteered opinions as to the legal ramifications of H.R. 1694.

But when Conyers turned his attention to veterinary science and research, which was the heart of the hearing, he was no match for Tobin. Time after time after time after time Conyers led with his chin, citing from material which Tobin quickly showed to be horribly outdated, in light of recent findings.

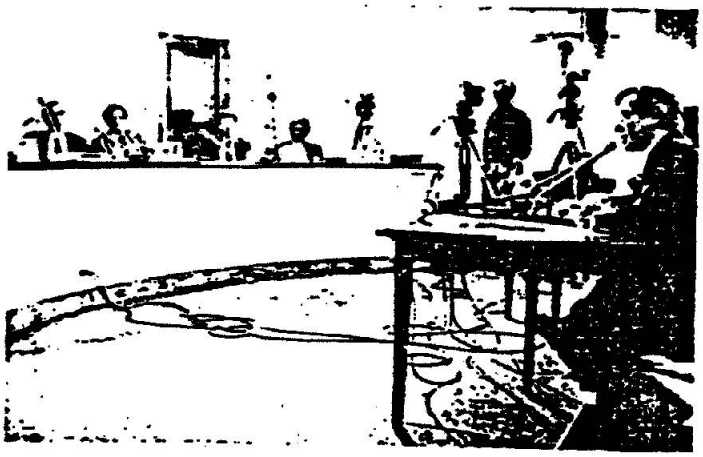
Conyers kept reaching back, to his aide, trying to come up with something, anything, that would take him off the hook. He realized, as a politician, that this day the roles suddenly had been reversed. The hunted had turned on the hunter.

Frustrated, Conyers gave up trying to trip Tobin on medical matters. He attempted, instead, to attack Tobin's background. He had no chance there, either.

All in all, thanks to Butler, Vienna and Tobin, the HBPA provided racing with far and away its finest day in federal "court." But don't simply take my word for it. Read the Conyers-Tobin dialogue that follows. Thanks to Tobin's answers, Conyers' questions couldn't have been better — on behalf of racing:

CONYERS: We have here, Dr. Tobin, some quotations from some medical journals that have guided us in the past, and I would like to solicit your views about them.

One witness stated: "The logical treatment for horses suffering from severe pulmonary hemorrhage is rest from racing," and Dr. Robert Cook, a fellow of the Royal College of Veter-



Tobin testifies before the House Criminal Justice Subcommittee. Paying attention are (left to right) Rep. George Gekas, minority counsel Raymond Smietanka, Rep. Bill McCollum and Rep. Michael DeWine.

inary Surgeons, emphasizes in his book "the breaking of blood vessels can be prevented if the stress which produces the hemorrhage is removed — if the horse is taken out of the training. Trainers are often reluctant to follow this advice, but a method of emphasizing the need for at least some rest from racing is to ask the

Dr. Thomas Tobin

trainer what advice he or she would give an athlete's son who coughed up blood from the lungs after a 200-meter hurdle race.

"Unfortunately, just as trainers" — this is the witness now going on, and I have provided you with a copy of this testimony — "Unfortunately, just as trainers attempt to keep the musculoskeletal cripples racing by the use of Butazolidin, they also strive to keep their pulmonary cripples racing through the use of Lasix — practices not only cruel, but also appear to be based on misconceptions and untenable economics.

"The number of horses observed bleeding on the race tracks in California actually increased by 20 per cent after Lasix was permitted by the California Horse Racing Board.

"With the above statistics, Lasix could hardly be considered a drug effective in the prevention of pulmonary hemorrhage nor a drug necessary for the economic survival of horse racing.

"While the U.S. Food and Drug Administration has approved Lasix as a diuretic, it has never approved Lasix for purpose of treating horses hemorrhaging from the lung. Furthermore, there has been no evidence to date that proves that Lasix significantly prevents the occurrence of pulmonary hemorrhage, nor is there one iota of evidence to substantiate that Lasix cures pathological condition in the lungs which causes this hemorrhaging.

"In fact, according to the Arizona Racing Commission, it reported that the number of horses which have suffered bleeding during a race has been reduced substantially since Lasix was banned in Arizona in April 1981."

Are there any statements there that strike your attention, that would warrant your comment?

TOBIN: Well, my first question would be, can you give me the date of the Cook reference, Dr. Cook's quotation? Can you give me the date when that was made?

CONYERS: I have no way. I have never seen the book — *Equine Veterinary Journal.*

TOBIN: Yes. That is a periodical that is published in Britain, and it is an equine journal.

I do not recall the date on that, but if my recollection is correct that is at least — I can't give you the date, but I am quite sure that it antedates the de-

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velopment of the fiberoptic endoscope and the realization that pulmonary hemorrhage is a much more common event or occurrence in the racing horse than it was when Dr. Cook made that statement.

I do not know whether he would be comfortable with that statement today. I do know that — my best opinion on that is that it is quite a dated statement.

CONYERS: I see.

TOBIN: If you would like me to continue, I would like to just, first of all, point out that studies at the University of Kentucky and the Ohio State University have shown that Lasix has no effect on the racing performance of horses.

Now, if — and I believe this is Mr. (Humane Society of the United States field investigator Robert O.) Baker's comment — if his basic hypothesis is correct that furosemide will keep a pulmonary cripple running — and that is his statement there — one would expect to see some improvement in performance.

That is not so. In controlled studies at the University of Kentucky, at the Ohio State University, and in a retrospective study of horses actually running on the track, there was no evidence whatsoever of an improvement in performance.

If it is indeed a miracle drug, if it is indeed able to do what Mr. Baker says it does, keep pulmonary cripples running, this is not the result that one would expect. That is a clear-cut indication, from scientific information, that the hypothesis he has thrown out with no basis whatsoever is probably incorrect. It is certainly not supported by the data.

CONYERS: Well, he certainly didn't throw it out. He started off quoting what you claim to be now an outdated medical statement, which you apparently even concede was accurate at the time it was made. I, assuming that you are correct —

TOBIN: No, I can see that the clinical observations on which he based it — the perception of the clinical events has since changed. He might wish to change his statement based on our newer knowledge about

furosemide since he made that.

CONYERS: Well, let's not worry about him so much. What about the number of horses observed bleeding at the race tracks in California increased by 20 per cent after Lasix?

TOBIN: Chairman Conyers, I think that clearly shows that horsemen in California are rational men, and when they are permitted to use a therapeutic medication when it is approved they will come forward with their bleeders and say "I have a bleeder." When they are not allowed a medication, there is no advantage to them to say they have a bleeder.

That simply shows that California horsemen are rational and if they are permitted to use a medication, a therapeutic medication for a certain condition, they will come forward with their horses.

In the absence of permission to do that —

CONYERS: In other words, they are to be commended for their conduct?

TOBIN: I believe that if you can commend any man for rational behavior, I think one should. This is rational behavior.

CONYERS: All right.

Well, then Cook's statement is outdated in the *Journal*. So we will set that aside.

I just want to read this again to make sure, because I had looked upon this as critical commentary, and now I find out I have been misunderstanding it.

The witness said: "Unfortunately, just as trainers attempt to keep their cripples racing by the use of Butazolidin, they also strive to keep their pulmonary cripples racing through the use of Lasix. This practice is not only cruel, but appears to be based on clinical misconception and untenable economics.

"The number of horses observed bleeding on the race tracks in California actually increased by 20 per cent after Lasix was permitted by the California Horse Racing Board.

"From the above statistics, Lasix could hardly be considered a drug effective in the prevention of pulmonary hemorrhage nor a drug necessary for the economic survival of horse racing."

Okay. We commend them for that, their conduct, and find nothing wrong with it because they are perfectly rational men.

Let me go to the U.S. Food and Drug approval of Lasix as a diuretic but not for the purpose of treating horses for hemorrhaging lung, and you have the statement in front of you.

TOBIN: Which one, Mr. Chairman?

CONYERS: Page 39.

TOBIN: Which line?

CONYERS: Third paragraph.

TOBIN: I am sorry, if you could read it, it would help me find it.

CONYERS: "While the U.S. Food and Drug Administration has approved Lasix as a diuretic, it has never approved it for the purpose of treating horses hemorrhaging.

"Furthermore, there has been no evidence to date that proves that Lasix significantly prevents the occurrence of pulmonary hemorrhage, nor is there one iota of evidence to substantiate that Lasix cures pathological condition in the lungs which causes this hemorrhaging.

"In fact, according to the Arizona Racing Commission, it reported that the number of horses that have suffered bleeding during a race has been

substantially reduced since Lasix was banned."

So I would like you to comment about the drug administration's approval, the findings at Arizona, if you have any impressions about that at all.

TOBIN: Well, my impressions about Arizona would be the converse of the California situation. The drug was banned. It was eliminated. So people who had bleeders took them out of the jurisdiction in Arizona and brought them elsewhere.

Again, it is a natural and logical and rational result. If you ban a medication, people who have horses who need that therapeutic medication will take them elsewhere.

CONYERS: Well, maybe they won't run them.

TOBIN: That is also a possibility, Mr. Chairman.

CONYERS: Well, I am glad I thought of that.

I mean, you know, this is really kind of silly to present me with sort of ultimate factual —

TOBIN: I didn't present you with these statistics, Mr. Chairman.

Somebody else did.

CONYERS: Yes, but it was your thought that they would be run somewhere else rather than not run at all. I guess — or maybe that is based on your experience.

TOBIN: I said they would be taken — I do not recall my precise statement. It possibly is run or taken somewhere else. They will move from that racing jurisdiction.

CONYERS: And to another?

TOBIN: It depends on the choice of the horseman.

CONYERS: I see.

Well, let me read you something else and solicit your view.

According to Dr. Arthur Patterson, Equine Veterinary Officer for the U.S. Food and Drug Administration, "There is no doubt some trainers are using Lasix to mask other illicit drugs that may be administered before a race. Whether Lasix actually prevents bleeders is iffy. The real interest is in flushing and masking illegal drugs."

Your comment, if any.

TOBIN: Well, again, if you look at the date on that particular statement, I think it dates — actually, it is here in, unless I am much mistaken, Mr. Baker's book. It dates from '78, okay.

I started my research program at the University of Kentucky in 1975. About that time I started to publish my research results. Unless I am much mistaken again, I don't believe you were in the room when I testified about the pharmacological actions of furosemide.

I testified that the actions of furosemide were very brief. When it is given in the dose and by the recommended route by the American Association of Equine Practitioners (AAEP), the amount of urine produced is small. It is about four liters. It is a relatively small proportion of the body water of the horse. It is about 1 to 2 per cent.

That is all the drug that furosemide can move out of the body of the horse. It cannot significantly flush drugs out of a horse.

I have been making this statement repeatedly, and in the television program that we had here earlier today, that misstatement was made again. Furosemide does not significantly re-

duce the blood level of any drug test to date, and we have no reason to believe that it would.

To the best of my knowledge, that statement is in error, and we have substantial scientific evidence in the record before you to say that that is so.

With respect to the concentrations of drugs in urine, if the dose is the dose used in the treatment of epistaxis, if it is given by the correct route, research has shown at the University of Kentucky, and research which has been repeated in the quality assurance program has shown that at four hours, at more than four hours after administration of the drug there is no significant masking or drug dilution effect.

Work in my laboratory has shown that in fact the detection of some narcotic analgesics is enhanced if furosemide is administered under these conditions.

Does that answer your question?

CONYERS: Well, has anyone ever challenged this statement?

TOBIN: It has been challenged. I would be very happy to present you — counsel has a copy of my book. You will find it challenged in large black type in the copy of my book, which is to your left.

CONYERS: Well, I am talking — I realize you are challenging it, and I would assume you have written it, but the point is this sir. If this has been a mistake since 1978, we would welcome the evidence to point out that it is wrong.

TOBIN: The scientific evidence is in the binder that has been presented to the committee this morning.

CONYERS: And the scientific evidence is compiled by whom, since I haven't had an opportunity to read it?

TOBIN: The bulk of the work that is published in the scientific literature has come out of my laboratory. I understand that Dr. George Maylin (of Cornell University) testified for this committee at similar circumstances, and in his studies he also found no effects of furosemide under the conditions that I mentioned.

I believe if you check the record you will find that in it..

CONYERS: Well, the point that I am working toward is this. Here is an ol-

ficial of the U.S. Food and Drug Administration making a statement that apparently is widely refuted, or at least by you and one other person, and it has been there since '78 according to yourself, and I am just trying to piece together the logic how a statement that would have this large of an impact on an industry would not be brought more prominently into dispute than me holding hearings to listen to the different medical testimony.

TOBIN: You are in a much better position than I, Mr. Chairman. I am a professor at the University of Kentucky. I publish my science, and that is basically what I do.

I put it in the book that I wrote to review this field. The fact that I had to come here in person to testify as to my findings shows that the process is functioning.

CONYERS: Well, let me get into a few more statements here that we need to examine. Here is another textbook quotation, *Equine Medicine and Surgery.*

"The horse should not be trained while being given an anti-inflammatory drug because it will not protect the leg as it would if pain were experienced normally."

In another textbook in which Butazolidin is referred to: "In many cases it is used to alleviate symptoms of lameness without allowing sufficient rest for the healing of the part. In this case additional damage is done to the joint while the horse goes on with the racing workout. This eventually leads to a complete degeneration of the joint."

Now, it seems to me that in all these cases plus the one that I — the examples I have quoted before, we are talking about the improper use, and you keep talking about the approved and the appropriate amount of use of the drug, and I think we may be missing each other in that respect.

Could that be part of the problem?

We are talking about abuse of the drug, which is what gives rise to the federal government's concern about this. It is not, as you stated, that we would ban the use of the drug entirely, which is not the point of this legislation.

TOBIN: Mr. Chairman, perhaps I can accelerate the process. Unless I am much mistaken, that edition of *Equine Medicine and Surgery* was the second edition, which was — these comments have been spoken to in the testimony, and I will just read from the testimony.

CONYERS: Please don't. Just tell me if you disagree with them, or do you agree with them?

TOBIN: I disagree with Mr. Baker, and I was going to draw your attention to the current edition, a quote from the current edition of *Equine Medicine and Surgery,* which says about nonsteroidal anti-inflammatory drugs: "These products may also be used prophylactically since they do not impair healing or immunity. They are useful to contol postsurgical pain and swelling and may prevent the soreness and injury associated with training.

"Phenylbutazone administered 23 hours before time trials has improved

performance, perhaps due to the relief of subclinical lameness.

"In a controlled study, Naproxen, which is closely related to phenylbutazone and a similar drug, prevented training complications. Intermittent, two times to three times weekly, administration of similar products resulted in apparent clinical benefit."

In essence, the author — and this is the current edition, the most recent edition of *Equine Medicine and Surgery*, states that these agents prevent soreness and injury associated with training or, no doubt, Mr. Chairman, with racing, because racing and training are essentially similar.

Another work by Dr. Doyne Hamm has shown that when young quarter-horses in training and racing were treated with Naproxen, another nonsteroidal anti-inflammatory drug, there were less interruptions of training and racing in the nonsteroidal anti-inflammatory treated group.

For example, during the training season, the untreated group lost about 13 per cent of their training time due to musculoskeletal disorders while the Naproxen-treated horses lost only about 3 per cent.

That is a substantial difference. This study, in essence, showed that the use of this medication in training and racing horses enabled them to train and race more effectively.

I would say it is a '78 to '79 study, considerably more recent than — again, I am guessing the quotation that this refers to, since it is not cited here, but I think it is '72 to '73.

CONYERS: So you don't agree with what O.R. Adams said about Butazolidin that we quote here in his book, *Lameness in Racehorses*?

TOBIN: Mr. Chairman, he did not specifically name Butazolidin. He mentioned anti-inflammatory drugs in general.

I have not read that quote. I do not know whether he refers to steroidal or nonsteroidal anti-inflammatory drugs.

CONYERS: Well, it says in the witness' testimony that it was in reference to Butazolidin.

TOBIN: Again, I would have to accept the witness with that. And all I

can say is the Adams book — do w have a date on the Adams book? - the bulk of the work that Mr. Bake cites, the books were published in th early '70s. They relate, then, to wor completed in the late '60s.

Our perceptions today, with decade of experience with these drugs, is somewhat different.

CONYERS: What about *Merck Vet erinary Manual*?

TOBIN: *Merck Veterinary Manual* is compiled by veterinarians working in the Merck — I assume in the Merck Drug Company — by reviewing other works. They have no direct experience, and they are not, to the best of my knowledge, practicing veterinarians.

It is a compilation.

CONYERS: So you don't bother to agree or disagree with them?

TOBIN: With the Merck Manual?

CONYERS: Well, let me just make the statement without reference to the manual itself.

"Anti-inflammatory treatment combined with continued training and racing will accelerate the degenerative process within the knee of horses."

TOBIN: It depends on the type of anti-inflammatory drug.

CONYERS: I see.

TOBIN: And as near as we can tell, with the nonsteroidal anti-inflammatory drugs this is not a problem at the moment.

I quoted the Hamm study which showed that in actual fact the training careers of the horses was improved, and the racing careers.

CONYERS: What about the *Journal of American Veterinary Medical Association*? They sound pretty reputable.

TOBIN: Can you give me a date on that study?

CONYERS: No.

TOBIN: If it is — can you give me the quote?

CONYERS: Yes. You have it in front of you on page 37.

The quote is: "Because of the ability of phenylbutazone to reduce inflammation and alleviate pain, thoroughbreds otherwise unable to compete remain in training and race suc-

cessfully. This has led to the indiscriminate use of the drug at many race tracks."

TOBIN: That is dated February 15, 1970, Mr. Chairman. It is in the introduction of the paper.

When a person introduces a scientific paper, you feel free to pull hypotheses or statements out of the literature, out of the air that you are setting up for a study. It is a statement in the introduction to the study. It is a hypothetical statement by these people as to a possibility.

What the conclusions from that study were I do not know.

CONYERS: Do you agree with the hypothetical conclusion? Do you admit to its possibility of being correct?

TOBIN: The ability of phenylbutazone to reduce inflammation and alleviate pain within the constraints that I told you — the hypersensitivity pain is correct.

"Thoroughbreds otherwise unable to complete training have remained in training" — I have no scientific information whatsoever on that. I can't give you an opinion one way or the other.

"Indiscriminate use of drugs at the race track" — I cannot comment on that either.

CONYERS: Well, that is precisely why we have the bill before us, doctor. We are not talking about people that use — the trainers and the managers and owners that use it in discriminate amounts. There would be no point in us even coming here.

We are talking about the abuse, and that is why we have put together some very modest proposals for their control and also nationalizing them so that we won't have these incredibly different standards that frequently exist from track to track.

Well, tell me a little bit about your activities. You say you don't testify much, and I was beginning to think that you do quite a bit of this.

TOBIN: With respect to?

CONYERS: Well, why don't you tell me? I mean, I would like to now begin an inquiry into your background connection and activities with the horse racing industry.

TOBIN: I am a professor at the University of Kentucky.

CONYERS: What else?

TOBIN: I run a research program on drugs and race horses.

CONYERS: What else?

TOBIN: Those are my primary avocations. I write and consult on drugs and racing horses.

CONYERS: Do you have a research fund — a research program funded by Kentucky State Racing and Harness Racing Commission?

TOBIN: I do not have that. I work for the University of Kentucky, and I work in that program.

CONYERS: Well, that is another one of your activities?

TOBIN: That is my major activity.

CONYERS: That is your major activity?

TOBIN: Yes.

CONYERS: Do you teach?

TOBIN: Yes, I do.

CONYERS: All right. Tell me about the courses.

TOBIN: I teach in — basically, I teach in toxicology, which is —

CONYERS: And which ones are you teaching presently?

TOBIN: I am not teaching presently.

CONYERS: Not teaching presently.

What about some other research projects that you have worked with connected with the racing industry?

TOBIN: I have had money from the United States Harness — the Harness Tracks Association to work on reserpine. I have had money from the Horsemen's Benevolent and Protec-

tive Association for specific research on furosemide. I have had money from the U.S. Department of Agriculture to study endotoxin shock in horses.

Those would be the major monies that have come into me for research.

CONYERS: I have got 12 that constitute a million dollars — in excess of a million dollars worth of money coming in.

TOBIN: That is correct.

CONYERS: Is that correct?

TOBIN: That is correct.

CONYERS: Well, you left out a few then? But I can understand, you probably wouldn't remember them all.

TOBIN: You have them —

CONYERS: Let me just see if this is correct: College of Veterinary Medicine, MSU; Michigan Heart Association; the MUCIA Grant — I am not aware of what that is.

TOBIN: That was a grant to assist Indonesian students, or to educate Indonesian students.

CONYERS: What about the Kentucky Equine Research Foundation Grant?

TOBIN: That would be my — I believe — can you give the quick figure on that?

CONYERS: Yes, $900,000.

TOBIN: That would be my support from the racing commissions. That would be a cumulative sum over the years of support from the racing commissions.

CONYERS: From 1973 to 1981?

TOBIN: '73 would be a misprint.

CONYERS: I see. What is correct?

TOBIN: '75.

CONYERS: I would like to find out a little bit more about these. I probably won't be able to do it today.

What about the U.S. Trotting Association Detection of Reserpine Administration in Horses? Do you remember that grant?

TOBIN: Absolutely. It resulted in the publication of two scientific papers.

CONYERS: Are you under only one grant at the moment or more than one?

TOBIN: At the moment I have the money from the racing commission, and I have a specific grant from the Equine Drug Research Council to research masking by phenylbutazone in racing horses.

CONYERS: What other states have you operated in?

TOBIN: Have I taught in or — I have been a professor at Michigan State University. Prior to that I was a doctoral candidate research associate at the University of Toronto.

CONYERS: Where else?

TOBIN: Prior to that I was a veterinary student in Ireland . . .

All I can say, Mr. Chairman, is that I have put my information, my science in the scientific literature. I have put it in books. I have never said anything in front of a group that I have been disturbed about.

The University of Kentucky has paid my fare up here because of comments made about the quality of the Kentucky drug testing program and because they are proud of the research program that I run, as I am.

This is a controversial area, Mr. Chairman, and tempers run high.

That is all I can respond to that. Thank you. □